to chemical action in the water or to mechanical action knocking off the particles of chemical matter already formed Water without sediment, so far as he could discover, could not do this; the erosive process was due to the presence of sand.

Mr. Davis observed that it would appear that even the purest water would erode when aided by heat. Erosion was due to the entrainment of water in the drum, aided by the presence of sand. The remedy, either in drums or in coils, was to establish perfect drainage.

Mr. Fladder wished to know whether after all there was not some impurity in the water; water chemically pure might still contain mechanical matter.

Mr. Holloway said that in the case of a plate (which was shown to the members) the erosive action had honeycombed it, not acted in a smooth or uniform way.

Mr. Nason did not think it was necessary to look for anything beyond erosive action.

Mr McBride said the boilers (in the case mentioned) were insufficient for the work they were used for, and it was reasonable therefore to look for a considerable amount of *debris*. There being no return pipe, this was of course deposited as a covering over the pipe, and the steam coming in with great velocity gathered it up and deposited it on the opposite side.

The next paper read was C. W. Hunt's on "A New Mechanical Fluid."

Mr. Rockwood wished to know how this method could be used —could it be applied to large bearings ?

Mr. Hunt did not know; it was a new thing. It had worked well in that it was very fluid. In a machine which he had modelled, the action could be seen admirably, and it was curious to watch, upon a change of adjustment, the strange way the balls moved, something like the eddies in a strong current of water.

W. S. Rogers observed that a good many firms used such balls for packing pumps, etc., and, as far as he had heard, they had proved a very satisfactory packing.

Mr. Brashear supposed the action of the balls, like that of a liquid, was not affected by the height of the columns

Mr. Hunt said the peculiar action of the balls was no doubt due to their friction, one against the other, and against their envelope.

Prof. F. R Hutton then read his paper on the "First Stationary Steam Engines in America," but owing to the lateness of the hour, discussion was left to be carried on by means of correspondence.

There was also a paper by J. R. Freeman on "A New Form of Canal Waste-Weir."

FRIDAY, STIL JUNE.

On Friday morning there was another session devoted to professional papers, the first one read being De Courcy May's "Cost of an Indicated Horse-Power."

Mr Cary remarked that the question of horse-power was one of very great importance He then told how he himself had once put together the cost of the various items in detail, which had to be considered, in order that he might arrive at the exact cost. The result showed that what cost about \$37 per horse-power was sold on the average for about \$55, though in New York city perhaps the cost was somewhat higher still.

Mr. Holloway said the element of cost for horse-power or steam-power necessarily varied very much in different localities, depending on the cost of fuel, the sort of coal (whether there was much or little slate in the latter), and on many other things distinguishing the particular place in question. It was necessary to know also the type of engines and the cost of water also.

F. L. Hart related his experiences when endeavoring to arrive at some conclusions with regard to this question. In his works they had, in connection with their feed-water system, a method of getting at the exact amount of water used, and they utilized this for testing the different quantities required under different conditions.

Mr. Cary said that he had made all his calculations on the standard recommended by the American Society of Mechanical Engineers (32½ lbs. of water), and he then went on to explain how he had managed with a series of reservoirs, by means of which he was enabled to avoid the necessity for any meter, with considerable advantage.

The next paper read was the "Effect of Varying the Weight of the Regenerator in a Hot-air Engine," by Prof. G. W. Bissell.

There was no discussion on this paper.

W. R. Roney's paper on "Mechanical Draft for Boilers" was the next on the programme.

Mr. Cary said he had described before the society, on a presous occasion, an almost similar appliance which he had himself invented. A large firm with whom he had dealings at the time said his idea was impracticable, and refused to put themselves to the trouble of making a special fan for the apparatus. He believed that now, however, the same firm made many such fans. His apparatus, he said, was quite successful, and worked very uniformly and economically.

Pres. Coxe remarked that the waste and cost of running a chimney were something enormous. The most expensive way of getting a draft was to build a chimney, even though the chimney were given you The thing to do was to control absolutely and perhaps automatically the flow of gases through.

Mr Rockwood said the question of a mechanical draft and the question of getting rid of noxious fumes and economizing were totally different matters. He doubted even if the author's calculation of the saving of fuel effected were a fair average, whether the appliance described would be altogether worth putting in. If they got all the saving that they could by using a compound engine, what was the absolute saving effected by the use of an economizer? An economizer was an expensive article, and took up a large amount of valuable space.

Mr Roney said the whole question hinges upon the coal. Had a large or a small amount to be paid for coal?

R. C. Carpenter's paper was then read on "The Saturation Curve as a Reference Line for Indicator Diagrams."

No discussion.

At this point the secretary read the society's addresses of thanks to the entertainers, who had done so much towards making their visit to Montreal a happy experience, and one to be remembered for a long time. These were addressed to the mayor and city of Montreal, to McGill University, to Sir Donald Smith, its chancellor, to Prof and Mrs. Bovey, and Mrs. Redpath, to Herbert Wallis and the local committee of reception, to Prof. J. T. Nicolson, its secretary, to the Montreal Street Railway Co., to the G.T.R. Company, and the Harbor Commissioners.

These addresses having been adopted in the usual way, the secretary asked the members of the society to render thanks for the favors on the programme which they had yet to enjoy.

Prof. Jacobus then read a paper by himself, in conjunction with Professors Denton and Rice, on the "Results of Measurement of the Water Consumption of an Unjacketed 1,600 h.-p. Compound Harris-Corliss Engine."

Mr. Ball remarked that the paper was a valuable contribution to the transactions of the society. He regretted, however, that the author had not seen fit to think out some theory to account for the extraordinary economy of the engine under experiment.

Mr. Rockwood said there were meters and meters, but in this case no doubt it was of the accurate kind.

Prof Jacobus said the meter was all right. The fact that one meter went wrong should not make people think that all were bad. If put in correctly there was little chance for a meter to go wrong. He then related some other tests which went to check and prove the thorough accuracy of the one under discussion. The reason that meters showed wrong sometimes was that they were allowed to get air in them.

The last paper on the programme was by F. B. King, consisting of "Notes on the Corrosion of a Cast Steel Propeller Blade, "

Mr. H B Roelker stated that he had experienced results similar to those described.

Mr. Henning thought the corrosion was due to the air which rushed into the vacuum near the blade, passing behind the propeller and thus corroding it. The reason that the earlier blades corroded more easily than modern ones was that they were made of a higher quality steel, which was more easily affected. The higher the carbon, the less the corrosion.

Mr. Grundy stated that the British admiralty recognized magnetic action and put ziuc near the boiler plates.

On Friday afternoon different parties of the Engineers visited the C. P. R. works and the Canadian Rubber Company's factory, after which there was an enjoyable garden party at Piedmont Hall, Mrs. J. H. R. Molson's residence.

SATURDAY, 9TH JUNE.

The final day of the convention was devoted to an eveursion to Ottawa, the C. P. R. Company having kindly proffered a special train for the occasion.

On reaching Ottawa at 11 a m the visitors were met by a reception committee, composed as follows -J W McRae, H. B. Spencer, T. Alcarn, George H Millen W Y Soper, M Donaldson, George P Brophy, P. D Ross, R. Surtees, Thos. C. Keefer, J. R. Booth, J. Fred Booth, F. W. Avery, Wm. Scott, Hon. E. H. Bronson, W L. Marler, A. R C Selwyn, E B Eddy, Sir James Grant, M.P., H. Robillard, M P., Sandford Fleming, Louis Coste,