

The Spectroscope.

London Times.—The spectroscope and its results seem to be coming more and more prominently forward and at every successive meeting of the Association. The instrument is in some respects the most potent and widely useful weapon in all the armory of science. In the hands of the astronomer it can tell us what is going on in the sun and the condition of the most distant stars, and in the hands of the analyst it can detect the adulteration of the commonest articles of food. Thus all the sections are interested in it and its improvement, and the standing Committee on Spectrum Analysis is one of the most important supported by the Association. Dr. Schuster's report this year contains a considerable amount of data bearing on this department of scientific progress, and the Association is doing a great service to science in continuing to support the Committee. No better method could be adopted, not only of improving the instrument, but of collecting and sifting the information obtained by those who work with it. Of the results obtained by the spectroscope at the recent eclipse we have already given a summary, and the account communicated by Dr. Schuster and Captain Abney, contained nothing essentially new. Calcium and hydrogen were detected in the sun's corona, and the spectrum showed lines which the astronomers cannot yet read. In another solar paper by Dr. Schuster, he suggests that the changes which are noticed in the form of the corona may be partly due to the fact that it is of meteoric origin, to some extent a revival of a theory at one time popular, that the sun itself was maintained in fuel by the groups of meteors spread all over the system. One great difficulty in solar spectroscopy is to detect what really belongs to the sun and what originates either in the earth's atmosphere or in the space which separates us from the central light. If Dr. Siemen's hypothesis is correct, it will be no easy matter for the spectroscopist to penetrate the supposed intervening matter, and therefore, Captain Abney's visit to the Riffel (8,500 feet high) was an essential useful service. Although he found the spectrum of the sun at that height the same as in London, still he found a vast diminution of light as well as of aqueous vapour, and curiously an increase in alcohol, which leads him to conclude that that potent spirit is of celestial origin. Although Dr. Glasher, who has been miles higher in a balloon than Captain Abney, doubts the diminution of aqueous vapour, Professor Langley, one of the ablest spectroscopists in the United States, essentially confirms the Captain's conclusions. The long papers read by Professor Langley was one of the most valuable contributed to the meeting, giving as it did, the results of spectroscopic work in the rare and pure atmosphere of Pike's Peak, thirteen thousand feet above sea level. Captain Abney has shown that there are rays (in the red) invisible to our rude eyes (though Sir John Lubbock gives reasons for believing that ants can detect them), and Professor Langley has found under his more favorable conditions that there are rays which even Captain Abney has not been able to detect, but which his barometer has shown. Nearly three fourths of the whole solar energy, he maintains, exists in the invisible portion of the spectrum. Professor Langley insists on the embarrassment introduced in the way of solar spectroscopy by our complicated atmosphere, and he believes that if we could get outside of this the solar spectrum would present a very different aspect. Even the corona of the sun and the solar atmosphere itself must be pierced before we are able to say what is the real composition of the central nucleus. The spectroscope, in the short period since its invention, has done so much for a knowledge of the sun, and our in-

vestigators on both sides of the Atlantic are evidently so fully alive to the difficulties that beset their inquiries, that we cannot but be hopeful that in the near future they will be able to overcome them. Then if we go to the Chemical Section we find Professor Huntington reporting on the use of the spectrum for chemical research, especially in reference to the detection of the exact composition and condition of metals; and here, also, we find the path of accurate and trustworthy spectroscopy beset with difficulties. Intimately associated with this department is the subject of the wave-length of the various kinds of light, and hence the importance of Dr. Marshall Watts' report of the Committee for the Preparation of Tables of Wave-lengths.

The Asia Disaster.

The verdict of the jury in the case of the propeller Asia, which foundered in Georgian Bay during an unprecedentedly severe storm on September 14th, strikes at the root of the cause of the disaster in the following paragraph:—

"From the evidence produced we do not consider the old Welland canal style of propellers suitable for lake navigation, on account of their bluntness, fore and aft, causing them to draw the water after them, thereby rendering the steering of them difficult in bad weather, especially on local routes, where the quantity of freight varies from one to three or four hundred tons. We also condemn them for the slightness of construction and height of upper works."

The construction of the propellers in use on the upper lakes has been the real cause of the great majority of the disasters which have occurred year after year, and no inspection laws, however strictly enforced, no experience on the part of sailing masters, however widely acquired, can provide a remedy. In some cases the laws have doubtless proved defective, either in the scope, or in the administration of them, the loss of life has been rendered greater because of overloading, and because of an inadequate provision of life saving apparatus, but with all these defects remedied, with the most careful precautions against accident which the law can provide, the danger will be mitigated only in a small degree. Many of the defects of inspection will be remedied by the Act passed last session and now in force, and greater care will henceforth be exercised in granting certificates to captains, pilots and engineers, but even then the possibility of disaster is far from removed. A thorough reform in the style of propeller construction is above all things required. The Asia was in good repair and perfectly seaworthy. So far as the evidence went there is no reason to believe that any precautions of the law could have averted the disaster to a vessel of her type. What is demanded is not merely a modification of the present style of propeller, so as to provide a stronger hull, lower upper works and sharper lines, but as near an approach to the style of the ocean steamships as navigation of the canals will permit. The lake vessels ought to be as seaworthy as our lower port steamships. The storms of Lakes Huron, Erie and Superior are quite as dangerous, at times, as those of the Atlantic, and tax the sea-going qualities of a craft quite as severely. There is, of course, a difficulty in constructing vessels on the ocean steamship model for canal navigation, for the reason of the light draft necessary to the passage of the canals, but for vessels plying the upper lakes the season round, and using only the lock at Sault Ste. Marie, there should be, we imagine, no difficulty in adopting the model of the lower port steamships. In any case, it is clear that the chief element of danger in lake navigation will only

be removed by altering the present style of propeller construction so as to give them a firmer hold in the water, and greater resistance to the violence of the storm in future.

—Gazette.

The Weather.

The August number of the *Monthly Weather Review*, just received, is, as usual, full of interest. During that month but few storms were reported, and none of them particularly severe. Professor Loomis has determined that the average velocity of storms in this country for the month of August is 18.2, and for the year 26 miles per hour. In that part of the *Review* referring to International Meteorology and for the month of September, 1880, an extraordinary typhoon, attended in its course by a remarkable depth of the atmospheric depression, is described, a vessel reporting the barometer falling from 29.64 to 27.04 in four hours. Snow squalls were reported during August from Sandusky, Grand Haven, Utah, and Colorado. Some of the specially heavy rainfalls during that month were at St. Augustine, 5.22 inches in five hours; at Bunker Hill, Ill., 3.20 inches in one hour and thirty minutes; at LaCrosse, Ind., 2.05 inches in thirty minutes; at Cincinnati (on the 27th), 1.85 inches in thirty-five minutes. These were tremendous down-pours, but to produce Noah's flood required a steady shower of forty days and forty nights' duration, and at the rate of 5.29 inches per minute.

The Ottawa "Astronomer."

The *Cincinnati Commercial* thus refers to the Ottawa "Astronomer":

"A new weather prophet has arisen. His name is Wiggins, and his home is in Canada. He speaks and prophesies in no uncertain way. He fixes on the time when, and the place where a great meteorological catastrophe will happen. On the 11th March next, says Wiggins, a great storm will sweep over the entire country—such a storm as the oldest inhabitant has never witnessed. Upon the Atlantic none but "huge leviathans whose oak (steel-plated) ribs make monarchs tremble in their capitals" will be able to outride its violence. The great sea itself will arise and "cast itself upon the continent," the low lands along the coast will be submerged, and the very mischief be to pay throughout the Western World.

Wiggins does not pretend to explain why this cataclysm will take place on the 11th of March, but it is not the business of a prophet to assign reasons, as witness those of the Old Testament, the unraveling of whose prognostications has engaged the minds of eminent commentators in all ages without arriving at definite conclusions.

It is sufficient that Wiggins has spoken, and that he claims to have predicted the recent great storm that poured water upon New England by the bucketful to every square inch of soil, doing immeasurable damage. The inhabitants of the low coast land should, therefore, pack up and prepare to migrate to the interior or to the mountain tops; yet we suspect they will not do it. Unbelief is as rank as it was among the Antediluvians. Noah preached the coming great flood for a hundred years or more, and built a vast ark as an evidence of the sincerity of his belief in that aqueous catastrophe, yet he made no converts outside his own family, and the pairs of each living species of bird, beast and insect which he hustled into the ark before the windows of heaven were opened and the storm came, and the foundations of the great deep were broken up. As it was in Noah's day, so it will be now, and Wiggins will survive to shake his head solemnly and say: "Didn't I tell you so?"