

subjects to their pupils and not to prepare the teachers to pass examinations. The payments made by the Board during the quarter amounted to about \$100,000.

DEGREES of a 'Chicago National University' have been for sale in London. The *Times* states that it has "received a telegram from Mr. Francis Harkins, the Chancellor of the Chicago National University, stating that that university repudiates agents who offer degrees on payment of a guinea." There are five hundred colleges and universities in the United States entitled to confer degrees, but the 'Chicago National University' is not one of them.

MISS MARTHA VEEDER has been appointed professor of mathematics at Huguenot College, Cape Colony.

M. JUMELLE has been made assistant professor of botany, and M. Beaulard assistant professor of physics in the faculty of sciences of Grenoble, and M. Brunhes has been made professor of physics in the faculty of sciences of Dijon.

DISCUSSION AND CORRESPONDENCE.

METEOROLOGICAL OBSERVATIONS DURING AN ATLANTIC VOYAGE.

TO THE EDITOR OF SCIENCE: A few notes of meteorological interest, made during a recent voyage from New York to Rio de Janeiro, may not be unwelcome to the readers of SCIENCE. The trip itself is one which cannot fail to interest anyone who has a knowledge of meteorology, for the steamer route crosses several of the great wind and calm belts of the world, and the characteristic features of each belt are brought into striking contrast as the ship passes from prevailing westerlies into 'horse latitudes,' and then successively through N. E. trades, 'doldrums' and S. E. trades, the voyage ending in the 'horse latitude' belt of the southern hemisphere. A teacher of meteorology who has the good fortune to take this voyage must constantly feel how grand an opportunity the trip would give him to teach the great facts of this science to a class of students, if he could only take his class with him. It would indeed be field-work, if such an expression may be used, on a magnificent scale.

The formation of cumulus clouds over islands has been noted by many observers in different parts of the world, but is always of interest. On June 8th, early in the afternoon, the ship was some distance to the eastward of Bermuda. The sky, except in the west, was covered with strato-cumulus clouds, and the wind was light from S. S. W. On the western horizon the sky was lighter, and the sun was shining on the low clouds. In this direction, which was that in which Bermuda lay, could be seen a considerable number of cumulus clouds, radiating from below the western horizon, and moving across the sky to the N. E. These were evidently coming from the island, for in no other part of the sky were there any other cumulus clouds to be seen. The cumuli diminished rapidly in size as they increased their distance from their place of origin, and they were lost sight of as the ship's course took her farther away from the island. Another observation of cumulus clouds formed over land was made on the morning of June 23d, when about 10 miles off shore north of Bahia. There was a splendid development of cumuli over the land, the shore-line to the north and south being outlined in the sky by the clouds, while over the ocean there were only a few scattered trade cumuli.

On June 9th (noon position 29°43' N., 59°23' W.), between 3 and 4 p. m., there was a fine opportunity to study the growth and mechanism of an advancing thunderstorm. These storms, as the writer has pointed out in an account of the thunderstorms of New England, advance, when well developed, in a long line (storm-front), but their activity is not the same all along this line. In some places where there is more active convectional ascent the rain and thunder and lightning are more severe, while at other points along the same storm-front there may be no rainfall, and the clouds may even seem to break away. It is these apparent breaks along the storm-front which give rise to the common statement that thunderstorms 'divide' over an observer, when in reality there is no true division. On the day in question the thunderstorm when first noted was a single large cumulo-nimbus cloud to the west, and the heaviest rain could distinctly be

seen falling below those portions of the cloud which showed the most lofty tops. These extra heavy rains were seen falling in three places under the main mass of the cloud, and over each of these places the height of the cloud was noted as being especially great. While watching this cumulo-nimbus it was noticed that to the south of it there were some cumulus clouds developing rapidly into cumulo-nimbus and becoming part of the same cloud as that first observed. In this way the storm-front was seen to be extending itself gradually farther and farther to the south, new cumulus clouds continually developing into cumulo-nimbus and joining themselves to the parent storm-cloud. Thus, in an hour, more or less, a long storm-front was developed, extending with a N. E.-S. W. front across the greater part of the western sky. The movement was to the N. E. Careful observation of the storm-front showed distinctly the centers of extra heavy rainfall and the lighter portions in between these centers. In these lighter portions either no rain or light rain was falling.

At sunset on June 18th, in the S. E. trade (noon position, $0^{\circ}16'N.$, $38^{\circ}47'W.$), some observations of degrading cumuli were interesting. The afternoon sky was fairly well covered with trade cumuli, some of the clouds almost reaching the cumulo-nimbus stage. Just after sunset careful observation of these clouds showed them dissolving and toppling over in a very striking manner. The clouds were in shadow, and were clearly outlined against the bright sunset sky behind them. The process of disintegration was of two kinds. In the first the top of the cloud, bending forward in the direction of the prevailing wind, simply toppled over to the northwest, breaking off, so to speak, at the point where it joined the main cloud mass. The upper part, after toppling over, quickly evaporated, and a long line of trade cumulus would thus lose their typical form and become flattened out into a long band, which, in time, also broke up and faded away. In the second kind of disintegration the *shape* of the top of the cloud remained unchanged during the process, the cloud particles simply dissolving as they kept their position with relation to the cloud base. Thus, in a few minutes, only the

skeleton of the top of the cloud was left, and this also soon evaporated, leaving, as in the first process, a long flat band of cloud. The two processes were quite distinct, although they were both processes of disintegration. In explanation of these phenomena, it appeared that the second kind of disintegration occurred only when the clouds were large and well developed, *i. e.*, where the supply of water vapor from below was probably still active, and the effect of the faster-moving upper air in blowing forward the top was not so strong in consequence. For this reason, the cloud kept its shape well, dissolving without being toppled over, while in the first case the cloud was probably in a stagnant condition, and its top offered less resistance to being blown over.

In conclusion, a few directions of cloud movement may be of interest, although comment on them is omitted by reason of lack of time at the present writing.

June 10. Lat. $26^{\circ}58'N.$, Long. $55^{\circ}41'W.$ Cirro-stratus from N. W. June 11. Lat. $23^{\circ}45'N.$, Long. $52^{\circ}30'W.$ Cirrus from S. W. June 13. Lat. $16^{\circ}35'N.$, Long. $47^{\circ}34'W.$ Low fracto-cumulus from E. N. E. (wind direction); alto-cumulus from N. E. June 17. Lat. $3^{\circ}29'N.$, Long. $40^{\circ}44'W.$ Cirro-cumulus from E.; cumulus from S. E. (wind direction). June 18. On equator. Cirrus and cirro-cumulus from E. by S. June 19. Lat. $2^{\circ}42'S.$, Long. $36^{\circ}43'W.$ Cirro-stratus from E. by S.

R. DE C. WARD.

BUENOS AYRES, July 14, 1897.

SCIENTIFIC LITERATURE.

Travels in West Africa. By MARY H. KINGSLEY. The Macmillan Co. 1897. 16 plates, 29 illustrations in the text. Pp. xvi. + 743. Cloth \$6.50

An interesting book in spite of some defects. It takes Miss Kingsley 120 pages to get settled down to the subject of her 'beloved southwest coast;' and the 400th page is passed before you reach the valuable portion of the book.

There is little, past, present, or even future, in connection with West Africa that does not get a touch from her facile pen. There is however an easy flippancy of manner in the story