

effect, is an actual translatory motion shared by the whole vessel. By far the greater part of it is due to rocking about some centre (whether fixed or instantaneous), at some distance from the passenger, just as a boy moves really up and down on a see-saw, while the plank simply rocks about a fixed centre. A very large portion of the apparent motion of translation will therefore be cured by neutralising the rocking; and so far as rolling is concerned, we have no doubt that all rocking will be effectually cured. Even as regards pitching, we are disposed to think that in large vessels this is seldom very troublesome when there is pitching and nothing else. It is the combination of pitching with rolling which is so difficult to bear; and we have reason to know that a vessel's pitching is almost invariably accompanied with a roll of very considerably greater amount than the fore and aft motion. Apart from the much more confused and distressing character of the combined motion, we think that the pitching would be found to be a much smaller effect than is commonly believed, if the rolling were wholly got rid of.

On the whole, while we are unwilling to commit ourselves to any prophecy, either of complete success or of partial failure, we think very favourably of the proposal. As a mere scientific experiment it is one of the very highest interest. As a practical design it offers a sure prospect of realising a large part of its intention, and a fair prospect of attaining a high degree of success. We feel confident that it will save a great many who would otherwise suffer, from being sea-sick at all, but we can hardly hope that there will not be sufficient residual motion in very heavy weather to cause some degree of uneasiness to very sensitive persons; nor would we venture to predict what will be the numerical reduction in the proportion of persons relieved from sickness, or the amount of alleviation to those not wholly saved from it.

It remains to say a few words on the question of safety. The inquiry of the timid will be, What if anything goes wrong? How will you control this great moving mass of 150 or 200 tons if a valve should give way or a pipe burst? The answer is immediate. In case of accident, the saloon would simply be disabled from moving independently of the ship, and the worst that could happen would be that the passengers would not get the relief desired, but would simply be as in the saloon of an ordinary vessel, and with much better ventilation. Even if the machinery broke down badly, it would be the work of a moment for those in charge to jam the saloon most effectually, so as to make it a fixed part of the ship. The hydraulic machinery is similar to that which has been for a long time used by Mr. Bessemer in controlling large masses of molten iron, and has, therefore, been fully tested and shown to be efficient.

#### SCIENCE IN CEYLON

A SUPPLEMENT to a recent number of the *Ceylon Observer* contains the first address of the new Governor of Ceylon, his Excellency the Right Hon. W. H. Gregory. On the opening of the session of the Legislative Council, his Excellency proposes to take a vote of 50,000 rupees for the commencement of a Museum of Natural History and Antiquities. The cost of the building when

completed in the rough is to be 80,000 rupees. He says, "the want of a museum in which may be represented the natural history, antiquities, and industrial products of the island has been forcibly urged on me by persons of all classes. For a comparatively small sum, considering the object in view, a museum may be constructed, which shall not be a mere random collection of miscellaneous objects, but a scientific teaching exhibition. To carry out thoroughly our purpose, it will be necessary that the head of the institution should be a person competent from knowledge and scientific training to arrange in proper sequence the various specimens as they come in, to give information to the student, and probably to give lectures occasionally on the different branches of the collections, such as on the principles of classification, the habits, instincts, and economical uses of each class." The salary of the Director to be appointed is to be a liberal one, in order that a man of high acquirements may be induced to undertake the task. The archæology of the island is to be well represented in the museum, and to contain reproductions of the many ancient inscriptions therein existing in the form of photographs, casts, and hand copies. The collection generally is to be strictly confined to the products of Ceylon. New regulations are to be made for the management of the forests and to prevent the present waste of timber, for the carrying out of which foresters are to be appointed. A hope is expressed that the cultivation of cinchona will be extended. The soil and climate of Ceylon are peculiarly adapted to the growth of this plant, Ceylon samples of bark fetching a higher market price than similar ones from Ootacamund. It is also hoped that the production of tea may be taken up by the planters. Silk may, perhaps, also be added to the productions of the island. The mulberry tree grows quickly and vigorously in Ceylon, the worms are reported hardy and to thrive well; but difficulties arise from the want of patient and skilled hands in the winding of the silk. The dried cocoons would probably have to be sent to Europe to be spun, as they are at present in largely increasing quantities from various parts of the East. Regulations are to be made for the preservation of game, *i.e.*, deer, elk, buffaloes, and pea-fowls, not for the benefit of the sportsmen, but for that of the native population.

The natives complain that bodies of strangers enter a district, drive into a narrow compass and shoot down and wound large quantities of deer, the flesh of which is dried, carried away, and sold; that this wholesale destruction goes on at all seasons; and that the breed of buffaloes is deteriorating by the slaughter of the wild males. The tame buffaloes are, in Ceylon, turned out loose into the jungle when not employed in the paddy fields or elsewhere, and interbreed with the wild ones. During the whole of the Governor's journeys in the northern and eastern provinces he saw only two deer and heard one pea-fowl, although riding over ground where, a few years previously, all kind of game abounded. We think the Governor was unlucky in his experiences. There are still plenty of peacocks to be seen about Trincomalee, at least where we lately came across upwards of thirty in one afternoon. It is still extremely desirable that the wanton destruction of game should be put a stop to. A close time is to be enforced, and driving prohibited except by the inhabitants of a dis-

strict. Reference is further made to the late floods. Within the last fortnight a great calamity has befallen us. Inundations to an extent unknown in the colony for a long series of years have inflicted serious though only temporary damage on a large tract of country. The loss of life, so far as I can ascertain, has been but small, considering the suddenness and extent of the floods; but many houses have been swept away, and a large amount of native property destroyed."

It appears that a bridge on the Randy railway, that over the Hanwella road, was broken down by the flood, and at the time the Governor spoke traffic with the Central Province was interrupted. Three persons employed in the department were drowned when the railway bridge was swept away. Science is evidently not likely to suffer in the hands of Mr. Gregory.

OCEAN METEOROLOGICAL OBSERVATIONS

Remarks to accompany the Monthly Charts of Meteorological Observations for No. 3 Square, extending from the Equator to 10° N., and from 20° to 30° W. (Printed for private circulation, by authority of the Meteorological Committee of the Board of Trade.)

THIS portion of the Meteorological Committee's work in the discussion of Ocean Meteorology has been printed by the Committee for distribution among meteorologists and others, with the view of eliciting their opinions on the utility of the method adopted, together with any suggestions they may have to offer. The chart issued with the remarks gives the results of the discussion of No. 3 Square of Marsden's numbered squares for the month of January. This square has been selected as the one of greatest importance, and in which the largest number of observations have been collected. It is divided in the chart into 100 squares of 1° each, in which are set down, in a compact form, the results of the discussion as respects wind, variation, atmospheric pressure, air and sea temperature, humidity, the currents and specific gravity of the sea, and, in the margin, weather and cloud.

In attempting to give the results of so many subjects in a small space, and with one printing, not a little has been sacrificed to clearness. The chart has considerable merit as an ingenious and compact tabulation of results; but little praise can be awarded to it as a chart or diagram telling its own story at once clearly and readily to the eye—a characteristic which charts specially addressed to seamen ought to have. Printing in colours would introduce some improvement, but as regards the important subject of the winds more will be required, if the present method of presenting the results be adhered to. By this method the arrow representing the largest number of wind observations extends to the centre of the circle included in each square; and hence the arrows representing the winds of different squares cannot be directly compared together. Since such comparisons can only be made by the arrows of each square being drawn to show by their lengths the percentages each wind direction is of the whole number of winds observed in the square, a separate wind chart will be necessary in the text accompanying the charts.

Three small charts are given with the Remarks (p. 43), showing the pressure and temperature of the air and the

temperature of the sea. These have been constructed by grouping the 100 squares into twenty-five squares of 2° each. As respects pressure, the isobarics are drawn for every two-hundredths of an inch of mean pressure. The *outré* forms of the isobarics are such as to suggest the idea that the method of discussing the barometric observations is faulty. An examination shows it to be so on two important points, which will appear from the following extract from the chart of the observations of the four contiguous sub-squares (Nos. 59, 58, 49, and 48), of which the mean pressures are stated in inches, the number of observations in each case being printed within brackets:—

6° N.	29.882 (3)	29.963 (14)
5° N.	29.870 (2)	29.939 (15)
4° N.	30° W. 29° W. 28° W.	

In the small isobaric chart these four results are treated as of equal value, and the average of this 2° square is calculated by taking their simple arithmetical mean; accordingly 29.914 inches is entered as the mean. Now a little reflection shows that the averages 29.882 and 29.870 inches, based respectively on 3 and 2 observations, are very faulty as approximations to the true averages of their squares. In such cases the method of discussion is to deduce the new averages not from the averages of the four sub-squares, but from the whole of the observations added together and divided by 34, the number of the observations. By doing so we obtain in the above case the average 29.940 inches. Similarly we have discussed the whole of the 100 squares, and the result is the disappearance of several of the anomalies in the new isobarics drawn from the twenty-five new averages thus calculated.

But other anomalies remain, which lead to the second point on which the method of discussion is defective. The method is thus described in the Introductory Remarks (page 1):—

"The various hours at which the observations were taken may not give the mean result for the twenty-four hours; still, as the same hours have been generally extracted, we may confidently hope that the temperatures and pressures obtained from the means of the whole will give very good relative results for comparing the meteorological state of one part of 10° square with that of another. In making the extracts the hour of each observation has been recorded, so that any inquiry depending on the hours might be carried out if thought requisite."

The confident hope here expressed is very remarkable in the face of the averages printed on the chart, of which an example is given above. The truth is, comparableness of the results of the different squares is not to be looked for except in cases where the observations are numerous. Since the daily range of the barometer is large in these regions, averages based only on a few observations—regarding the hours at which they were made we have no information—are worthless in every inquiry in which comparisons require to be made. Now looking at the squares, we find from the chart that there