22. G. F. TYDEMAN, 'Hydrographic Results of the Siboga Expedition,' Siboga-expeditie, Monograph III. Map I. and II. Leiden, 1903.
23. R. D. M. VERBEEK, 'Topographische en geologische beschrijving van een gedeelte van Sumatra's Westkust.' Batavia, 1883.
24. R. D. M. VERBEEK, "Molukken-Verslag," *Jaarboek van het Mijnwezen*, vol. 37, Wet. Ged. Batavia, 1908.
25. MAX WEBER. See above, No. 14.

Before the paper the PRESIDENT said: The lecturer this evening is Dr. Molengraaff, who is the head of the Geological Laboratory at the Technical Institute, Delft. He has paid three long visits to the Dutch East Indies and travelled in the interior of Borneo and Celebes, and is one of the greatest authorities on that region. We and the Dutch, for many centuries, have been rivals in the East Indies, and I understand from Dr. Molengraaff's paper that he proposes that we should be rivals for many million years yet. He is going to give us an account of how the Himalayas of the future are arising out of the Dutch East Indian archipelago. In that part of the Indies over which we hold administration there are the highest mountains in the world, but Dr. Molengraaff will tell you how perhaps still higher mountains are at this very moment emerging from out the ocean depths which may in course of time—I do not know how long—arise and rival the Himalayas. It is by great kindness on the part of Dr. Molengraaff that he is speaking to us here in England. He has taken the trouble to come over from Holland to read us this paper. He has not had much practice lately in giving public lectures in English, but I am sure you will all appreciate his consideration in speaking to us in our own language.

Dr. Molengraaff then read the paper printed above, and a discussion followed.

Dr. FRIDTJOF NANSEN: I am very unexpectedly called upon to speak to-night, and I can say only it is with the deepest interest I have listened, as I am sure we all have listened, to this most interesting lecture, and heard all these very important results that have been obtained by this hydrographical work in the East Indies. There is one part of this lecture which has appealed specially to me, as it covers much the same ground as I myself have been investigating, namely, the shelves of this Mediterranean sea of the tropics. It is one of the biggest submarine shelves in the world. There is another shelf of similar large extension, but formed in different circumstances, north of Siberia, which I had the very good fortune to investigate myself. The depths are, as far as I understand, very much the same; the configuration seems to be very similar, and the edge lies very nearly in the same depth. These are two of the greatest shelves in the world; the third is east of South America. The depth is to a great extent about 40 fathoms, or less than 100 metres. The shelf north of Siberia is something like 400 or 500 miles broad, and the sculpturing of the surface seems to be very much the same. You call it a peneplain. I think that is quite right, but it is a peneplain that at least in the north has to some great extent also been levelled by marine denudation. I don't know how far that is the case with the shelf in the south, but it is with the shelves of the Polar Sea. There the marine denudation is chiefly caused, in my opinion, by an action not possible in the tropics, namely by the frost. I think the frost on the shoreline is one of the chief reasons why the shelves on all sides of the Polar Sea are very broad—very broad north of Siberia, and I am sure we are not mistaken if we think it also very broad north of the unknown coast of the American continent.

We do not know yet its extension towards the north. This frost denudation has been very violent on account of the low temperature, which has caused the water and the ice and snow on the shore to alternately melt and freeze and made the sea eat gradually on to the land. The land has been denuded by the atmospheric erosion, and more or less transformed into a peneplain that is approaching the level of the sea, but I consider it quite impossible that the peneplain could be formed so perfectly level as these drowned plains really are. I understand from the map that the surface of this East Indian shelf is perhaps not quite so level. It is, however, remarkable that under so different conditions, as in the tropical sea, where the erosion is chiefly caused by chemical action at high temperatures, and the Polar Sea, where caused chiefly by the frost and low temperature, the results should turn out to be almost the same—shelves with nearly the same level surface and same features, and they are submerged about the same depth. They seem to indicate that there must have been a general rise of the sea surface during modern geological times. The chief reason for this must be that the volume of the sea has been increased partly by the melting of the great ice-caps of the Ice Age. The sea must have risen something like 100 metres, or 50 fathoms, because all the shelves in the world are submerged about that depth, and it is a remarkable feature, wherever we go we find an indication of this same shelf. I believe that we have here still a great field for future investigation that will tell us much about the past, I mean in modern times, of the oscillations of the sea-level and the land surface, and I congratulate the Dutch Government and people on the splendid results that these Dutch investigations in the East Indies have given.

Dr. J. W. EVANS: It gives me the very greatest pleasure to welcome my old friend Prof. Molengraaff. We have followed with the keenest interest and instruction what he has had to tell us this evening. He has taken us to one of the most critical portions of the whole crust of the Earth, where those two great lines of crustal weakness—the tract surrounding the Pacific and that which extends from east to west across Europe and Asia (what he calls the Alpine tract)—meet together, and there we find action of the very greatest importance proceeding. The surface of the Earth is like an ice-floe composed of great solid blocks which are always crumbling against one another. These blocks as a whole seem almost immune from any change, but in between them are very energetic movements. It was just one of these intervening regions which Prof. Molengraaff has been telling us about to-night. To the north is one of the solid floating masses; to the south another, and between them is an area subject to great lateral pressure, resulting in a series of folds; and Prof. Molengraaff has described to us in the clearest possible manner the evidence for the existence of these folds. Apparently at present, as far as I have been able to follow the lecturer, they are of a comparatively gentle character, more in the nature of undulations; and they therefore represent a very early stage in the history of mountain building. Many myriads of years must pass before these regions can rival the Himalayas in the complexity of their structure, and much must happen before then. There will be great thrusts from one direction or the other. At present I understand there is in the area described by Prof. Molengraaff very little evidence of this. If, on the other hand, we examine the remains of the old mountain ranges, formed when these islands were subject to movements similar to those now in operation in the Malay archipelago, but far more intense, mountain ranges which have long since been worn almost flat by atmospheric agency, we find there have been gigantic thrusts from the south which have piled up masses of the Earth's crust one upon

the other. I should like to thank Prof. Molengraaff very heartily for the interesting and instructive lecture he has given us to-night, and express the hope that it will be by no means the last we shall have from him at the Royal Geographical Society.

H.E. THE NETHERLANDS MINISTER: There has been every reason for me, as the President very kindly acknowledged, not to put myself to the front, but nevertheless, on account of the pleasant moments we have passed on the water with Prof. Molengraaff, I feel the need to speak and to give vent to the feelings dominating me at this moment. The first is one of great thankfulness to this distinguished Society, and especially to the President, for the delightful hours he has allowed me to pass amongst you. In the second place, I think you will acknowledge and admit the feeling of national pride that has come over me as being the representative of the country whose son we have heard reading this paper to-night. The great eloquence, with which Prof. Molengraaff has been able to explain to his distinguished audience with such clearness this paper, fills every Dutchman, and especially, I must say, the representative of Holland, with what I hope you will call legitimate pride. But in the third place, every medal has two sides, and the dark side is the knowledge of what an utterly ignorant person I am when I heard this learned man speaking about things I did not understand until I came here to-night. I must say we diplomatists (and I hope my distinguished friend Sir Walter Townley, who is here, won't reproach me for speaking in the plural) very often move in such a small circle that when we find ourselves confronted by men of science, as I have been to-night, we feel more helpless than ever. But you have put before me the great ambition to know more of these things, and I am sure a great many amongst the audience will share the feeling. If you make up your mind to see if Prof. Molengraaff was right in everything he said and want to convince yourself with your own eyes, do not go at once to the Colonies, but make a little stay in the mother country first. There is nothing which contributes so much to bringing two people nearer to each other than personal contact, and Holland and England, the Dutch and the British people, have so many things in common, they ought to be brought into nearer contact. Let that be one of the consequences of the delightful evening we owe to the Royal Geographical Society and Prof. Molengraaff, that many of you may go, in coming years, to Holland.

Sir WALTER TOWNLEY: As the President has just said, I suppose that the honour thrust upon me as I came into this room of expressing your thanks for the great interest of the lecture we have listened to, was due to the fact that I am the Chairman of the Council of the Anglo-Batavian Society which has been recently formed, the object of which is to further good relations between the Dutch and the English. You can imagine then that when I heard in the first opening utterances of the President a sort of hint that Prof. Molengraaff was going to sow the seed of further rivalry between the two peoples, who had been rather rivals for so many years, I received a slight shock, my object being the reverse. I listened, therefore, with the greatest interest to what Dr. Molengraaff had to say, and it was with considerable relief I weighed it up, and I made up my mind that at least what was to come was not going to come for centuries. Then I saw it was the rivalry of the old traveller in India, who felt as if the great mountain he had explored and loved so well was to have some of its glories taken from it. I think he need have no fear on that score. What he has done in the Himalayas will live for a long time, but that will be forgotten by the time these other mountains have grown up. We have learned

to-night a great deal, which has been most interesting, but I think something else also both from the paper of Dr. Molengraaff and from the speech of His Excellency the Netherlands Minister, and that is that people in Holland speak our language extremely well. Do you think there are many Englishmen who could get up and deliver a lecture like that without looking at his notes in good consecutive Dutch? There are very few. Is not that rather a good lesson for us? It has been my privilege to spend two and a half years in Holland, and nearly all the Dutch speak French, English, German and probably Italian as if these were their own languages. I should like our educational authorities to bear that in mind, and see if it is not possible to improve us a great deal in this direction. I should like to second the vote expressed by the Dutch Minister that the British and Dutch people get to know each other better. I came away from Holland with a determination that I would do what I could to further the bettering of good relations and good understanding between the Dutch and English. I do not wish to say any more except to ask you to allow me to express in your name our most grateful thanks to Dr. Molengraaff for his most admirable lecture, to which we have listened with so much interest.

The PRESIDENT: I am sure you would wish me to second what has been been said already by His Excellency the Netherlands Minister and Sir Walter Townley. We have listened to a most valuable and interesting lecture delivered in our own language with perfect fluency, and the Professor has put before us an extremely complicated subject in an exceedingly clear manner. We shall all wish to thank him for having taken the trouble to come over from Holland and for the way in which he delivered this lecture.

SOME OBSERVATIONS ON THE APPROACHES TO MOUNT EVEREST

Lieut.-Col. C. Howard Bury

DURING the summer of 1920 I was in India, on a mission from the Society, interviewing the various authorities concerned and trying to get permission for an expedition to Mount Everest. Unfortunately I was unable to get back in time to hear General Bruce's most interesting lecture on the various projected attempts to approach Mount Everest, and the discussion that took place afterwards.

As he pointed out, the chief and in fact the only obstacles that lay in the way of an approach to the mountain were political difficulties; there were questions that arose in different years between the Indian, Tibetan, Nepalese, Chinese, and Russian Governments, and these had to be settled first. At last, however, these difficulties have been smoothed away, and permission has been granted by the Indian and Tibetan Governments for an expedition to proceed to Mount Everest. There is thus every prospect that in the year 1921 the secrets that surround and veil the highest mountain in the world will be uncovered.

The mountain can be most easily approached from the northern side, and the road from Darjeeling to Phari over the Jelep La, and then viâ