

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 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

Kampa Dzong and Tingri Dzong, would appear to present the fewest difficulties.

The direct road to Kampa Dzong viâ Gangtok and the Teesta valley, though it may be a day or two shorter, has many disadvantages. It is very little used by pack transport, and the path for several days follows the bed of the hot and feverish Teesta valley, where the rainfall is always heavy and where leeches abound. In places below and above Chungtang, where the path cut out of the solid rock overhangs the Teesta and Lachen rivers, there is hardly width sufficient for pack transport, and the loads would have to be taken off the mules and carried across these places. Whereas by going over the Jelep La the zone of the leeches and the heavy rainfall is soon crossed, and once in the Chumbi valley the climate is excellent, and there are no difficulties for pack transport. This is at present the main trade route into Tibet, and every day great numbers of mules and pack-ponies cross over the Jelep La, and in consequence grain and fodder can be obtained without any difficulty. From Phari to Kampa Dzong there are no obstacles; there is a regular trade route taking from three to four days and crossing over open and undulating country.

From information that I was able to obtain, the road from Kampa Dzong to Tingri Dzong presents no difficulties, and takes about seven days; from high ground north of the Naku La I could overlook several days' marches along this road, which appeared to follow along broad valleys about 15,000 feet above sea. There seemed to be no obstacles, or high passes which it would be necessary to cross.

Mount Everest I saw on several occasions in September, but always in the mornings or evenings. During the daytime heavy monsoon clouds would work up the Arun valley and into the side valleys, penetrating a certain distance into Tibet before they finally disappeared. From this it would appear that though Mount Everest lies out of reach of the main strength of the monsoon, yet clouds and snowstorms are frequent round its summit, especially in the afternoons. It lies, however, in a far better position with regard to weather than does Kangchenjunga, which seems to attract to itself all the heaviest storms.

I do not think that there are any advantages to be gained by making use of the lower Arun valley or of the Popti La and the Pangu La. Permission might be given by the Nepal Government, though they would not be enthusiastic about it. The paths through Nepal are bad and very fatiguing, and in the long run would prove to be no shorter, and would not be suited for pack transport. On the other route viâ Phari and Kampa Dzong pack transport of mules, ponies, or yaks can be used the whole way. There is a daily post to Phari, and letters only take three days from Darjeeling. There is also a telephone and telegraph line from Darjeeling to Gyantse, so that communication with the outer world can be kept up the whole time.

Aeroplanes would be of no use in Tibet, for though there would be

many places where it would be possible to land, yet owing to the density of the atmosphere at those heights being only half what it is at sea-level, it would be impossible for the present type of machine to rise again off the ground.

It would have been very interesting to have made a reconnaissance of the southern slopes of Mount Everest by flying up the Arun valley from the plains of India. This would have been probably feasible with a D.H.9a, but would have necessitated our providing at our own expense an aerodrome at the foot of the hills, the nearest permanent aerodromes being at Allahabad and Calcutta. The Air Force in India would have been very glad to help, but they have been limited in their own expenditure and would not have been able to devote any of their small budget to a side show, though they would be prepared to lend us a machine, pilot, and photographic apparatus.

The Air Force have had but little experience of flying in the hills, and the experiment would have been an interesting one for them. Where they have flown over hills, as on the North-West Frontier, they say that the air is full of bumps and air-pockets, necessitating their keeping their machines always at least 2000 feet above the level of the ground.

Beyond this reconnaissance from the south, I do not think that aeroplanes in Tibet could be of much use to the expedition: the general height of the country precluding any active co-operation on their part.

In Tibet ponies and yaks are the universal means of transport, and no one walks if he can help it, so that all the fatigues of long marches at high altitudes can be avoided by riding. The ponies are quite acclimatized to the height, and the European who comes into the country will find that after a fortnight's residence at 15,000 or 16,000 feet, he will be able to do far more and with less fatigue than when he first arrived. At greater heights than this the vitality becomes lower and sleep at night becomes more difficult, but acclimatization for Europeans is quite possible up to 16,000 feet.

Yaks will probably be the chief means of transport: they are very hardy animals, and seem to be able to live and to thrive on the scanty herbage that appears among the stones. They do not mind altitude, and though they are very slow yet they are surefooted, and it should be possible to use them for transport up to at least 20,000 feet. The snow-line on the north side of the Himalayas is often at 20,000 feet and over, and owing to the lesser denudation these northern slopes are far less steep than those on the south side, as can be seen on Pawhunri, Chomiomo, and Lhonak peaks, where in every case the south side is a series of precipices, and the north side is a comparatively gentle snow-slope. We may hope that this will also prove to be the case with Mount Everest.

The Sherpa Bhotias will probably prove to be the best coolies for high mountain work, and young men should be picked out for this particular duty. The Bhotia too from the high villages in Sikkim, such

as the Lachen villages, people who pasture their flocks at high altitudes on the Tibetan frontier, should also prove useful. They are both of a sturdy race of mountaineers, not so independent as the pure Tibetan, and should prove amenable to training. They have also the merit of being hardy and accustomed to cold and the biting winds of the country. They should be in charge of their own sirdars, and I am rather doubtful as to the advisability of having Gurkha N.C.O.'s over them. A good cook with the expedition is of great importance, as it is most necessary to keep the digestion in good order at these altitudes.

DR. KELLAS' EXPEDITION TO KAMET

IN the course of General Bruce's paper on Mount Everest, published last month, it was announced that Dr. Kellas and Major Morshead had succeeded last autumn in reaching the saddle of Kamet (at 23,500 feet), but that transport difficulties had prevented the formation of a camp at that height, or any further advance.

Dr. Kellas had planned the ascent of Kamet with special reference to the physiological effects at high altitudes and the use of oxygen. The Oxygen Research Committee and the Medical Research Committee, under the authority of the Department of Scientific and Industrial Research, undertook to supply the necessary scientific equipment, which was forwarded by the Indian Stores Department to Kathgodam. Dr. Kellas had left for India in March, and the equipment had to be got together and forwarded to him. Some unavoidable delay occurred owing to the discovery that the very light oxygen cylinders, which passed their tests when newly made, lost strength rapidly and were not safe. It was therefore necessary to send heavier cylinders. Further delay was caused in the transport to India by certain shipping restrictions in the carriage of gas cylinders and chemicals; and finally there was some unexplained delay on the Indian railways, so that the start of the expedition from Kathgodam was considerably late, and to this one must attribute any want of complete success in the investigation. The preparations of the Oxygen Research Committee were made under the disadvantage that owing to ill health Dr. Kellas had been unable to attend to them in the preceding winter, and had to leave instructions for execution after his start. The Society must gratefully acknowledge the value of the contribution to the Mount Everest problem thus made by the Committee in difficult conditions.

Dr. Kellas, who has remained in India with the intention of making another attempt on Kamet next summer, has sent us a copy of the report he has made to the Oxygen Research Committee; and in view of its immediate importance to the Mount Everest expedition, we assume his permission to print the following extracts from it: