

doubt a mass of ice, but the rocks will then be in good condition, and Mr. Leslie Stephen's route may be taken with advantage. At other times travellers will probably prefer to follow Lord Melgund and Mr. Walker.

SUGGESTIONS AS TO THE BEST MODE OF CARRYING A
PACK. By H. B. GEORGE, M.A.

THERE is no question more perplexing to the mountaineer than that of baggage—what must be taken, and how it is to be conveyed. The vast majority of men find their comfort perpetually at war either with their purses or with their regard for their own muscles. A certain amount of *impedimenta* may be assumed to be absolutely necessary on every expedition which is not out and home again, there being no one who will literally and in fact content himself with a toothbrush; but it does not at all follow that one is bound to drag over every pass the entire kit brought out from England. Such a proceeding may suit the exuberant gentlemen who like a 15lbs. knapsack on their shoulders to steady them, and may not seriously incommode people with fathomless pockets, though even these, to whom the expense of additional porters does not signify, will greatly prefer to be saved the nuisance of them. Average mortals, however, who see that the strongest and most willing of guides greatly dislike carrying much weight when there is severe work to be done, who feel that their own bodies are nearly enough for them to lift in climbing, and that wearing a heavy knapsack destroys a great part of the pleasure which is after all their main end and object, and who moreover find it extremely inconvenient to be continually paying for porters, are always seeking how to reduce their baggage to a minimum, and how to carry it most conveniently. Mountaineers of some experience have usually either struck out a plan of their own, according to the exact amount of luggage each man finds necessary to his individual comfort, or have resigned themselves to dragging about the regulation knapsack in despair; but the weaker or less experienced seem to be still at sea. It is with the hope of assisting some few of the latter, and of being minutely criticized by the former, that I desire to call attention to a mode of carrying which I have myself pretty thoroughly tried, as very likely others have done also, and which has recently been recommended for the use of the army, after a laborious investigation by a committee of generals and medical officers, presided over by General Eyre.

I assume that the traveller divides his baggage into two portions, and that he only desires to carry with him such an amount as may suffice to give reasonable comfort for three or four days, say a shirt, a pair or two of socks, a pair of thin shoes or slippers, washing apparatus, and one or two maps or books. All this, and more than this, may easily be stowed into a waterproof bag, and the whole will weigh about 5lbs. (I have carried 6½lbs. in the way I am about to describe, without feeling any great inconvenience, but this weight is more than will usually be required). Many mountaineers are in the habit of carrying such a bag, but they sling it across them from one shoulder—a method of carrying which causes a pressure upon the chest, to me absolutely intolerable, and which often is a serious nuisance in climbing. But it may be carried with perfect ease and convenience at the small of the back, or rather just below that point, resting on the *sacrum*, or broad strong bone which connects the hips, by a single strap passing round the back of the neck, over the shoulders in front, and back in a slanting direction under the arms. For violent exertion it is well to wear something round the waist over the bag strap, to prevent it from swinging freely when the body is thrown much on one side; but this need not be drawn at all tight, indeed the rope used for safety is amply sufficient. As a practical example, to show how easily a small pack may be carried in this fashion, I may mention that, though by no means in the habit of carrying weight, I wore one during the whole ascent of the Jungfrau from the Wengern Alp, through every variety of mountain work, having put it on when we started from our bivouac, and never, to the best of my recollection, even loosened it until we halted for the night some sixteen hours afterwards.

The military committee recommend in the strongest terms the total abolition of the stiff-framed knapsack, and the substitution for it of a soft bag, to contain a rather smaller kit than at present, and to be carried upon the principle I have explained above. Inasmuch, however, as the soldier has to carry other things besides his kit, especially ammunition, they recommend the adoption of a leather yoke fitting the shoulders, resembling in shape the wooden yoke worn by a milkman, though considerably shorter and smaller. From the ends of this yoke straps descend in front of the shoulders in the manner I have before mentioned, slanting back to the pack which is placed on the *sacrum*; while the great coat, which must necessarily be carried at the shoulders, is suspended from the centre of the yoke behind the neck, and the ammunition

pouches are also partially supported from the yoke in a manner which does not concern us for mountaineering purposes. By means of this yoke greater ease is also afforded in carrying the pack, by attaching a third strap which goes straight down the back, and connects the middle of the pack with the yoke at the back of the neck. This extra strap might also be used without the apparatus of the yoke, and would very possibly give still greater comfort than a single strap passing round the neck; but it would not be practically very easy to adapt it, and the experience of those whom I have consulted tends to show that it is not at all necessary for mountaineering purposes. Those who are in the habit of carrying a plaid might find their account in either wearing such a yoke, or in devising some combination of straps as a substitute; very probably the former, though two or three ounces heavier, and obnoxious as a novelty to the innate conservatism of human nature, would prove the most comfortable plan. Others, who are content with merely a bag, can carry it thus with no more cumbrous apparatus than a simple strap, and without really impeding their activity. To the mountaineer as well as to the soldier it is essential 'not only to secure perfect expansion of the lungs, but to allow free action to the great muscles of the shoulder and back,' and this end is best attained, in the opinion not only of General Eyre and his colleagues, but also of the medical journals which have commented on their report, by the method of carrying weight here recommended.

It may incidentally be observed that the discomfort arising from the pressure of a strap, especially of a single strap curved so much as now recommended, arises mainly from its not lying flat, whereby the edges of the strap cut wherever the strain comes. This is caused by the straps being sewn on flat, or attached by buckles, neither mode allowing any free play to suit the curves of the body: and it may be totally avoided by attaching the strap with swivels, or the still more simple and effective expedient of a ball and socket. In this way the strap will lie flat at whatever angle may be required, may be lengthened or shortened to vary the pressure, or shifted from one man to another of different build, and will always fit exactly, and cause no more inconvenience than is inevitable from the weight to be carried. This applies at least as much to ordinary knapsacks as to packs carried in the other way: and in fact much of the difference in discomfort to each individual resulting from one knapsack or another depends upon whether the straps happen to be so affixed as to suit his figure. With rigidly attached straps, what fits one man will not fit

another, and, what is still worse, what is fairly comfortable to the wearer with one length of strap cuts him as soon as the length is altered. Not having been able to obtain a sight of the accoutrements newly recommended for the army, I am not aware whether their yoke is so made as to ensure all straps lying flat, though it may easily be done; but it is manifest that suspension from a yoke will obviate much of the necessity for straps crossing real points of pressure.

Some mountaineers will doubtless be inclined to object that they want no more baggage than can easily be stowed in a knapsack, and that they do not like the trouble of carrying two articles. Men who are contented to do without a second coat or pair of trousers, and who carry all their geographical knowledge in their own heads, might convey all they want in a bag such as I have described; for all they want would be summed up in the six or seven pounds which can be so carried. But the majority prefer to have a second suit of clothes, a book or two, abundance at least of socks, and miscellaneous comforts — enough to distend to the utmost a good sized knapsack, and to weigh fifteen or eighteen pounds. Some do not object to carry this weight on a good path, but it is only one man in a thousand who does not seriously dislike such a load on a glacier pass; and if one is making glacier passes without a second bag, there is no resource but to take the knapsack or do without its contents entirely. Both alternatives are misery, from which the only escape is by an expensive porter. The mountaineer, therefore, who is not satisfied with a maximum of six or seven pounds of baggage (for a greater amount will be too bulky to be comfortably carried in the manner I have been advocating), will do well to take with him two articles, a small bag in which he will himself carry some five pounds of immediate necessities, and a knapsack, or carpet bag, or any other article for his reserve baggage. The cost of sending this about will be really very small, not a fifth of what porters would otherwise cost him; for on high roads, where most men drive, there will be no expense at all—on good paths a guide will almost always readily carry a heavy load—and there are very few series of glacier passes where there is not tolerably easy and rapid means of communication between the two extremities. Sometimes it may be necessary or convenient to take all one's baggage across a high pass, but this will be but rarely, and after all will be only what is otherwise necessary on all occasions.

The evidence, given in General Eyre's report, of the soldiers who have tried his new pack, is very strong in its

favour, as compared with carrying the same weight in the old fashion, and coincides fully with the experience I can myself adduce. It may, however, be worth while to point out the special advantages to the climber of carrying his load, if he must have one, in this manner. Being supported partly by the shoulders, and partly by the strong bone on which it rests, the weight of the pack is distributed over the body, and very little pressure is felt on any one point. Being also placed close to the centre of gravity of the whole body and prevented from swinging loosely, it tends rather to preserve than to endanger the balance; whereas a knapsack carried on the shoulders materially disturbs the natural conditions of equilibrium, and often prevents the wearer from recovering himself when he has slipped or otherwise been thrown partially off his balance. It is not at all in the way in climbing, as a side-slung bag often must be, and though in descending rocks it may sometimes be inconvenient, yet it will be no worse than a knapsack in this respect, if as bad. Most important of all, it leaves the arms entirely free, instead of their being cramped by the knapsack straps under the armpits and by the pressure on the shoulder-blades—a condition of supreme importance to mountaineers, who often need to make their poles serve them as about the equivalent for two extra legs.

I am perfectly aware that this device is not new, as the principle of it was suggested years ago for the army by Sir Thomas Troubridge, though it did not in fact occur to my own mind independently; and I know also that one man's experience does not always accord with another's. But I have never yet heard a serious objection raised against this mode of carrying, if one is obliged to be a beast of burden at all; and I hope therefore that I shall not seem too zealous in urging its merits. Neither this nor any other plan is perfect, and I shall be very glad if criticism, however hostile, from mountaineers superior to myself, elicits some better method on a matter which is of vital importance not only to pedestrians, but also, as seriously affecting the army, to the whole nation.

THE COL DE PIERRE JOSEPH. By C. G. HEATHCOTE, M.A.

EVEN in the most deplorable weather some few amiable enthusiasts will generally be found at Chamouni in the month of August. At such times despair finds comfort in the wild prophecies of the natives, and the sceptic becomes tem-