



GIUSEPPE MISEROCCHI

MOUNTAINEERING

A STORY OF CHALLENGE AND SCIENCE





©

ISBN
979-12-218-0621-2

PRIMA EDIZIONE
ROMA 18 APRILE 2023

SUMMARY

PART I

1.1. Prologue, 9 – 1.2. Unveiling Nepal, 10 – 1.3. A spring day, 14 – 1.4. The return and the memory, 18 – 1.5. The final image, 19 – 1.6. The challenge, 20 – 1.7. The mountains in history, 21 – 1.8. Deciphering hypoxia, 23 – 1.9. The conquest of Monte Bianco, 25 – 1.10. The conquest of Signalkuppe on Monte Rosa (known as Punta Gnifetti), 31 – 1.11. The conquest of Everest, 33 – 1.12. High Altitude Physiology: the initial controversy, 42 – 1.13. The controversies continue: how does oxygen reach the blood?, 46

PART II

2.1. What is mountaineering?, 51 – 2.2. A key issue: good oxygen supply to the body tissues, 53 – 2.3. A hard worker: the heart, 54 – 2.4. A few suggestions to keep fit, 55 – 2.5. Grading exercise intensity: what is good and what is bad, 55 – 2.6. Atmospheric and alveolar gas pressures on increasing altitude, 57 – 2.7. The pathway of oxygen, 58 – 2.8. The response to hypoxia, 59 – 2.9. The respiratory function and hyperventilation, 60 – 2.10. The oxygen supply to the tissues, 64 – 2.11. Oxygen delivery to Mitochondria, 68 – 2.12. The Cardio-Vascular response to Hypoxia, 69 – 2.13. Maximum oxygen consumption decreases on increasing altitude, 70 – 2.14. Acute Mountain Sickness (AMS), 72 – 2.15. Pathophysiology of lung oedema, 74

– 2.16. Inter-individual differences in proneness to develop lung oedema, 75 – 2.17. Early symptoms of AMS, 77 – 2.18. Chronic Exposure to Hypoxia: Acclimatization, 79 – 2.19. Acclimatization in the “Low Landers”, 79 – 2.20. Acclimatization in the Highlanders, 80 – 2.21. Chronic mountain sickness (CMS), 84 – 2.22. Physical deterioration, 84 – 2.23. Comparison with animal tolerance to hypoxia, 85 – 2.24. Scrambling in the mountains with a backpack: what is the energy cost?, 87 – 2.25. Climbing for one or two days, 90 – 2.26. Nutrition on a Mountaineering Expedition, 91 – 2.27. Thermo-regulation and body fluid balance, 92 – 2.28. Muscles at work, 95 – 2.29. Fatigue, 97 – 2.30. A physiological challenge over the history: Everest without oxygen, 101 – 2.31. The Physiological Characteristics of the Great Mountaineers, 103 – 2.32. Comparing performances, 105

PART III

3.1. The Physical Preparation, 109 – 3.2. Functional Values, 109 – 3.3. Contra-indications to Mountaineering, 111 – 3.4. Training for Beginners, 112 – 3.5. Training Points for more demanding mountaineering, 113 – 3.6. Suggestion for a nice trip in the mountains, 115 – 3.7. Training for International Treks, 120 – 3.8. Mountaineering and Children, 124 – 3.9. Giving Up, 125 – 3.10. Aging, 127

PART I

1.1. Prologue

It was a great day, windy as usual at about 8000m. I could see the final ridge from South Col up to the summit of Everest. It didn't look so difficult, just a series of rocks and patches of snow, as many places in the Alps. The ridge involved no climbing simply a matter of walking. It was only 800m to the top. The wind scourged the ridge and formed tall plumes of snow which then dissolved in unpredictable shapes. Clouds were cascading down the mountain face, losing whiteness and lightness on their way, finally dispersing on reaching the bottom of the gorge. Down there, the "Valley of silence" which we had walked through the day before, remained hidden from our view. I tried to grasp the dimensions of the whole space as I gazed from the summit to the foot of the mountain. Above me, the squat pyramid looked at times either close or incredibly far.



Figure 1.1. Everest, the South ridge.

1.2. Unveiling Nepal

Shortly after boarding from Dehli to Kathmandu, kindly young air hostesses, wearing typical Nepalese dress, welcomed us on board with such beautiful smiles that I will always remember them. On the journey, out of curiosity, we peered through the windows, focusing our eyes, looking around impatiently and finally, there it was, in the distance, white, motionless against the sky and above the clouds — the Himalayas. We arrived in Kathmandu. Everything ran smoothly — our anxious questions about what happened to the wrecked planes on the side of the landing runway were met with the calm wisdom of the East — with a big smile we were told that the wrecks are very precious for recycling spare parts. The thing which amazed me the most is difficult to describe — kind of whirlwind, an image of a storm, a multitude, a swarm of people who amassed either side of the street, many in rags

with made-up eyes, a little Buddha, and then a barber who shaved his clients on the side of the street, right on the edge, so that trucks brushed against the barber's arm, his razor in his hand. There were so many distractions, novelties and diversions that time stood still and remained as motionless as the pleats and folds of the saris of the women waiting, crouching in corners in the twilight. The notion of time and haste disappears — everything moves slowly, as if another world, teeming with people, but silent and accepting. I experienced for the first time a sense of uneasiness with their glances to and fro — and this sense of feeling conspicuous would always follow me. The street ran along quiet farmsteads immersed in the lush vegetation, but no people were visible inside. All of life takes place on the streets, buying, selling and begging. There appeared the eyes of Buddha, the stupa (a domed Buddhist edifice) of Bodnath, the golden temple of almost 2000 years ago. Immense, immobile eyes, scrutinising and seeming to hide fleetingly behind the fluttering multi-coloured flags that every Nepali hands out to express their hopes and desires, while the eyes seem to pursue another course, far away, lost in thought. We alighted at the Shenker Hotel, a white building with a definite air of nobility, faded elegance and an old colonial feeling. Here we were, waited on hand and foot. I felt uncomfortable in this role, the discomfort increased when I crossed over the flower-filled avenue of the hotel and realised that what looked like a pile of discarded rags on the ground was, in fact, a man. As we set off walking, I was able to calmly absorb a myriad of images which could not but daze an ordinary western man. I acknowledged the hospitality, the cheerfulness, the smiles of people along the way, the extreme frugality, the beauty in everyday objects, the pale blue colour of the valleys in the morning. I saw the hard work in the fields.

So, following our way up the Khumbu valley, every day the air became thinner. After a few days we reached Thyangboche monastery, at 3,867 m. It is a community of monks and nuns, who are content with their yaks and hens. At one time, before the monastery was destroyed by fire, there were many visitors and passers-by. The menu for visitors is always the same: rice, curried potatoes and omelette with little pieces of smoked yak meat. At first, we found meeting the local people a little strange. I was mesmerised by their pure Tibetan appearance — the



Figure 1.2. At night sherpas cook their chapati.

plaits, a few hairs shaved on the chin, the necklaces made of corals, turquoise and other stones — considered the ‘eyes’ of Buddha. Our guides’ clothing consisted simply of sheep skin and footwear. They are nomadic by nature, living for the day. They earn a few rupees, carrying loads for expeditions. They have no shelter, all they possess is a knapsack, which also serves as a pillow. Naturally, they sleep in the open, usually gathering in little groups around a small fire of brushwoods, which is kindled throughout the night. They approach passing strangers offering turquoises or a few trinkets. They invest their few rupees in jewellery.

The monks are very busy, the time is marked out by prayer, agriculture, animal husbandry, artistic efforts such as prints on rice paper, carvings and images of Buddha — for a fee they will carve prayers on stones. The stones are piled together with others alongside the walls. The prayers increase and the walls lengthen, as the footpath extends into the long Khumbu valley, which leads to Everest.

After the monastery, we ventured higher in the Khumbu valley, the landscape became severe, dominated by the crest of the glaciers with



Figure 1.3. Stones with prayers along the Khumbu Valley.

the typical vertical grooves rendering it vertiginous and inaccessible. We felt far from the world, but also far from the mountain. In fact, the variation in height with respect to the summit oscillated between 2500 and 3000 m.

At sunset, the camp was a biblical scene, bright fires burning here and there, bundles and boxes scattered around. The freezing air descending from the glaciers, numerous porters sheltering themselves, hiding behind the rocks, which were easily confused with the grey stones of the moraine. The porters were Tibetans, nomads, allocated heavy boxes, which were six-sided, an uncomfortable mode of transport. They put the box on a stone and passed a type of long strap underneath and then they looped the strap over their forehead. They stood up staggering under the load and covered the ground quickly in little steps, visibly staggering, to look for another stone to put down their load and get their breath back. They eat and sleep in the open around a fire of brushwood — all their life is like that.

The boxes contain parmesan cheese, Parma ham and chocolate. I have the same ill at ease feeling that I experienced in Delhi and then in



Figure 1.4. Everest, Lotse and Ama Dablam.

Kathmandu, leaving the hotel Shenker. The Sherpas are a select group. They have tents and their wives follow, carrying our equipment on their shoulders. Then there are the Europeans, who travel lightly. They have kerosene stoves and extra jumpers — only a few carry their own load on their shoulders.

It was inevitable and absolutely logical that the classical grand expedition was destined to disappear and that the new figure of the Himalayan mountaineer would be closer to the style of the Tibetan nomad.

1.3. A spring day

There was a clear sky above me, beyond the clouds — and there was still a lot of light, while the world far below was already in the shadow. It was not possible to stay in the tent, the roar of the wind was unbearable. I was breathing well and felt fit. I had no complaints except minor, insignificant but persistent nausea in the mornings, above 6,000m.

One reaches the 8,000m level easily enough with a 12–14 kg load on the shoulders if one is quite fit and one does not use up energy needlessly.

There is a need to move gently, or better still, very gently. There is no need to have a race with anyone. Whoever pushes on regardless without listening to their body, is finished — as when during a marathon one does not manage the pace well and stops suddenly, one loses all strength. However, in a marathon, one can, though with difficulty, recover. It is incredible how suddenly one can go from extreme physical pressure to complete exhaustion and total inability to react. It is a chapter in Physiology that remains to be studied, it is not clear how an athlete may sustain a maximum workload and produce extreme effort close to the finishing line, and then collapse just after passing the finishing point.

In the mountains, there is a need to resist rushing, listening patiently to one's own breathing pattern. There is a need to reserve one's own strength wisely, maintaining a margin of safety, because there is no recovery from exhaustion, particular above 5,000m. Those who climb mountains have a certain tenacity. They never give up. Nevertheless, in the mountains, pushing oneself is different to other physical feats. In the mountains, there is a specific sense of total and unconditional surrender, of feeling the limits of one's endurance. This sensation contrasts with inward strength that one feels before exercise. The important rule is to rely on one's feeling of fatigue. Reaching 8,300m proved possible from initial Everest attacks. The problem was the last 500m; it took about 30 years to reach the summit!

Back to the British expedition in 1922, Finch reached 8300m using oxygen tanks, along the North ridge, the only available route from Tibet as, at the time, Nepal borders were closed. Finch, who was very athletic fought the wind in his attempt, while his two companions dropped at 8000m. He had bivouacked at 7600m, contradicting the physiologists belief that it was impossible to survive at that altitude. Finch could see the summit in the glimpses of the sky in the storm, but did a common mistake: he climbed at an exceedingly fast rate, 110m/h.

I peered below me at the mighty spur (the so called Geneva spur, so named by the 1952 Swiss expedition) which was arduous and wild but not as hard as, for example, the climb to the Mont Blanc up the Brenva spur. I could see the ice-fall which I had crossed the previous day, climbing hard and decisively, without thinking of anything but climbing and the ever-heavy backpack. Every climb ends gently, even when the goal is not the summit. The slope as if, by magic, vanished under our feet, our



Figure 1.5. Everest at sunset.

hard work erased, we realised that the horizon seemed really far away. This was a spot to rest and to admire. What surprised us was the distance we had covered — and to gaze up at the climb for the following day.

A glance at the summit, a glance at the spur and at the gusts of wind blowing clouds which obscured the ridge. Below, far away, incredibly far beneath us, the Pumori and to the left, the magnificent icy crest of Nuptse, outlined against the sky. Further up on the Lothse, an ugly, hostile, mountain, a grey bastion for those that come from afar; on closer inspection it seems milder and within reach. Lothse is connected to Everest via the South Col — it remains an ugly and unpleasant mountain. It makes you feel insignificant for the greater part of the approach march.

From a distance, even whilst still walking amongst flowers, the Lothse and Nuptse disdainfully block the view of Everest from which only the pyramid of the summit emerges, pink in the sunset, with the inseparable plume of cloud.

Then drawing near, Everest disappears and to see the summit, one needs to climb higher, to get over the ice-fall, the dangerous ice stacks and lose oneself in the “valley of silence” that extends above the icefall

up to the final ascent to South Col. The immense glacier suspended and blocked off from the right by the Nuptse, to the left by the south wall of Everest and at the end by the steep walls of the Lothse and the South Col.

Two dots were coming down towards me, from the slopes of the ridge, seemingly moving quickly at the typical heavy and swaying walking of a descent. I thought I would see them in a moment but they always remained small and far off like ants on the rocks of the crest of the summit. I sense that when the cloud cover is high, it rises to the sky, bending to the effects of the wind. I think, perhaps, the apex of the cloud cover brushes against the limit of the atmosphere at 12,000 m.

I look at the rocks and plates or seams on the ridge, now veiled by a disorganised pattern of cloud condensation, this alters the perception both of mass and distance and tended to flatten the image of the mountain reliefs. They had almost reached us, there was nothing dramatic in their progress, they were descending as if on a stroll over the final crevasses and they kept going over the last crevasse, when there was a frightening crack. The crack tapered and closed secretly, exactly in the place where everyone who had passed had placed their feet.

Laphka Tenzing, the lead Sherpa, is lean, composed — his features a little drawn; he had perspired a lot and had expended a lot of energy. He had a slight smile on his lips and a look of immense satisfaction in his eyes. Behind him was Shambu Tamang, younger and less conscious of the magic of the moment; they had the Tibetan scarf around their necks, a white cloth as did thousands of others all over Nepal, that flutter like the eyes of Buddha.

Tenzing said few words, a simple hug, a request for a cup of tea and a bowl of rice. He turned towards the valley, put the grains of rice all around the edge of the cup and whined a prayer of lament. The same noise that comes from the throat when you climb, painstakingly to those heights. Everyone around him maintained total silence.

The wind carried his words far off and also the grains of rice, which he threw into the air.

Regarding the slopes, which appeared to run easily up to the summit, I dared to ask, ‘what was the view like from up there and over the other side?’ He told me that from up there, Tibet was all dark, repeated shades of brown, as in a shadow, distant, cloudy and desolate; it is

more beautiful here — from the Nepal side. The Makalu lit up by the sun, then Kanchenjunga, the ridge of Nupse and then Makalu with its sharp profile — and he makes a gesture with his hands.

1.4. The return and the memory

I had a moment of anti-climax. I already knew the answer. I had read about it, so my question was trivial; but how can resist asking “what was the view like up there?” Then, the answer was obvious, generally, the view from above is beautiful. However, this was different from the usual. One would think that the view from the highest mountain in the world is magnificent from whatever direction you look.

Perhaps, what there is beyond the highest point of the globe cannot be other than an enigma, a mystery — there are insufficient adjectives to describe it; nor an ephemeral definition that distinguishes beauty from ugly or the infinite gradations of beauty.

This is the return that I love to remember, there were other returns but none as magical as this. I had not yet realised that the expedition was at an end. Perhaps, I should have decided to go up there alone, obeying only myself; a rebellion, a transgression, a fleeting moment which is only to understood with the passing of the years.

I knew from the outset that the expedition would instill in me a wonderful memory, linked to the country, the mountains, the flowers and also the smiling people of Nepal. A vast number live on almost nothing, with very simple lifestyles and a perennial smile on their lips. When they know there is a medical doctor, they come to look and surround him out of curiosity. To give medicines is a very simple act, very satisfying but also, how should one say, a little too easy. In fact, it attributes merit to the doctor that is really due to the medicine.

Going down the ice-fall looked awesome, I wondered how it was during the ascent. At the base-camp, they are uncorking bottles and I get one poured down my neck.

That strange and complex blend that inspired me to venture on this alchemy of science, mountaineering ambition and an investigative mind, would, if broken up, lose their unity.

Time dragged over the last few days in Kathmandu. The mountains are far-away and the heavy rucksacks no more. They remain 'up there'. There is general chaos. Even the memories are jumbled and have to be sorted through. It is also necessary to find space for presents, carpets, a little jewellery, some turquoises and Tibetan corals.

1.5. The final image

The final image, the Temple of Monkeys — a place of worship. A swarm of people, cripples, the blind, ragged, piled on the ground between a thousand temples, pinnacles, a multitude is asking for something. They dragged themselves along, chanting prayers and lighting candles. It leaves me feeling uncomfortable, I drop into a chapel. I move the tent flap in the dim half-light, I identify further suffering; a person with an opaque white cornea, a blank stare, a begging hand. Close by, in the dark the wail of a child about to cry. I go out to breathe, to escape the sweet taste and nauseating air and as I go out, I look up a set of stairs.

The stairs are grey with dust, I cannot see the top. I can hardly see the steps, then I see better and in the dust I make out tattered images, small skeletal bodies, deformed, climbing with difficulty in bare feet, step-by-step, swaying and leaning on a knotted stick. They pause for long periods to catch their breath, carrying baskets full to the brim with stones. I look around me and see no building work in progress. I see piles of stones and there, close by, camouflaged in grey, the poor exhausted figures seeking a moment of rest.



Figure 1.6. So, how about?

1.6. The challenge

I have always thought that it was much more difficult to write and convey stories and feelings onto the pages of a book that adequately capture the reality of what we see. Those who go into the mountains speak little but are constantly on the look-out. But this time I have a rather particular story to tell as I am speaking about a challenge, in sight of the summit; of a struggle between physical and mental strength, a contest between knowledge and daring, an ancient story but one that is still current. As a doctor, I had to take care of people, as a researcher I had to pursue a research program. I frankly admit that dealing with cases of high altitude oedema was quite a challenge and that such an experience certainly influenced the developing of my research interests.

Today, we know a lot of the physiological mechanisms triggered by exposure to high altitude, in particular large inter-individual differences can be identified. This, in turn, allows to identify people who can adapt better than other, a concept that can be extended also to