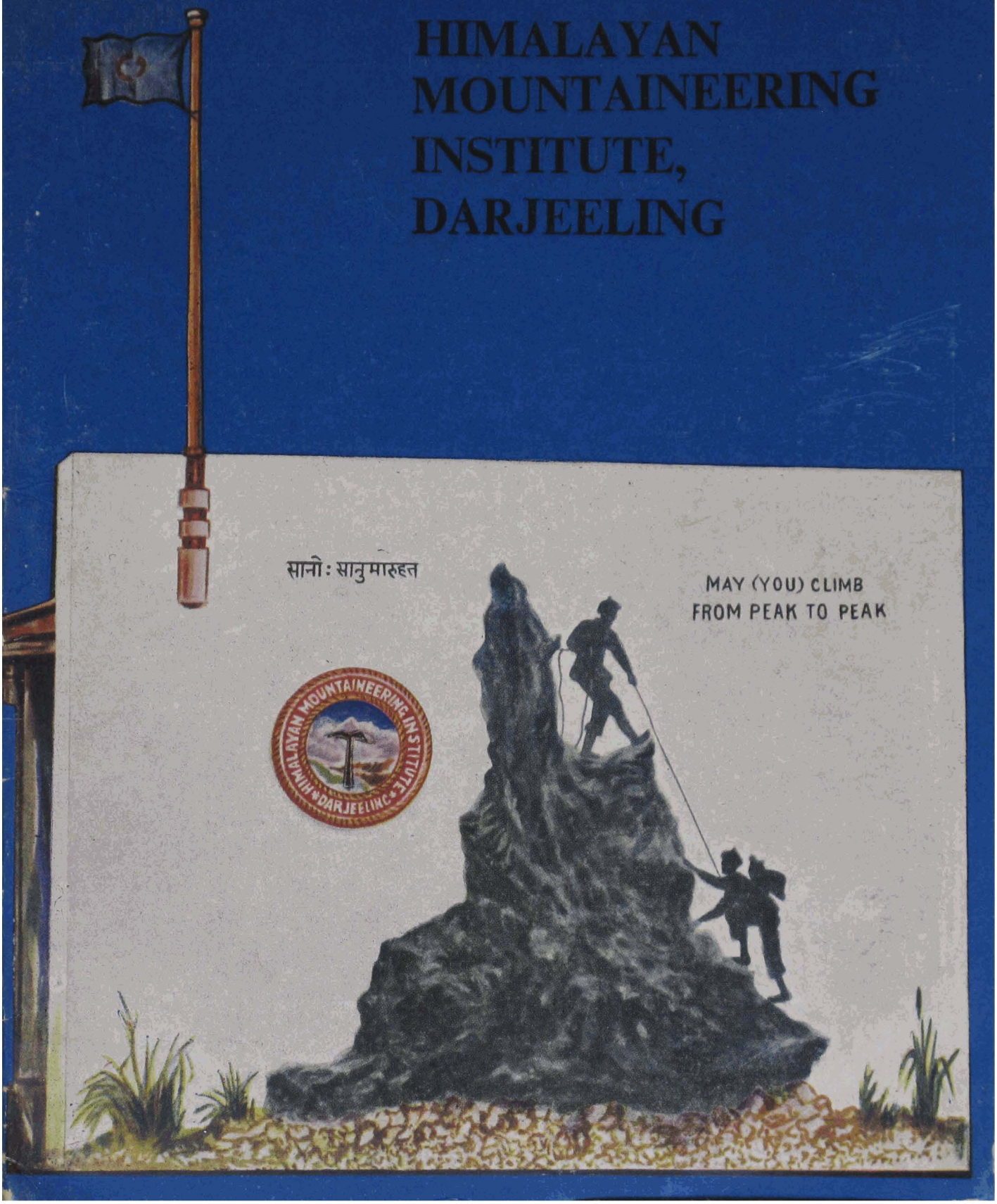
HIMALAYAN MOUNTAINEERING INSTITUTE, DARJEELING

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NANGA PARBAT
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BLACK PEAK
GANGOTRI
CHAUKHAMBA
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PANCH-CHULI
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CHAKRATA
BADRINATH
GURLA MANDHA
MUSSOORIE
NILKANTHA
TRISUL
RANIKHET
ALMORA
NAINITAL
DELHI

Executive Council Of Himalayan Mountaineering Institute

The Himalayan Mountaineering Institute, Darjeeling, is governed by an Executive Council constituted as under :

Chairman :
Shri Jawaharlal Nehru, Prime Minister of India

Vice-Chairman :
Dr. B. C. Roy, Chief Minister of West Bengal

Members :

Shrimati Padmaja Naidu, Governor of West Bengal

Shrimati Indira Gandhi

Maharajkumar Palden Thondup Namgyal of Sikkim

Shri Karan Singh, Sadar-i-Riyasat, Jammu & Kashmir

H. H. Maharaja Fatehsinhrao Gaekwad of Baroda

H. H. Maharaja Yadavindra Singh of Patiala

Shri G. D. Khosla, Chief Justice, Punjab High Court

Shri H. K. Desai, Education Minister of Gujerat

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Prof. M. S. Thacker, Secretary, Ministry of Scientific Research and Cultural Affairs, Government of India

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*Dr. D. M. Sen, Secretary, Bengal Education Department

Brigadier Gyan Singh, Principal of the Institute

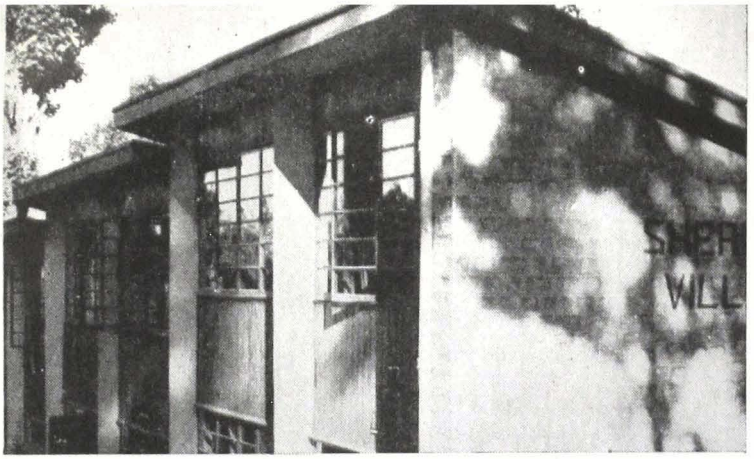
Shri Tenzing Norgay, Director of Field Training

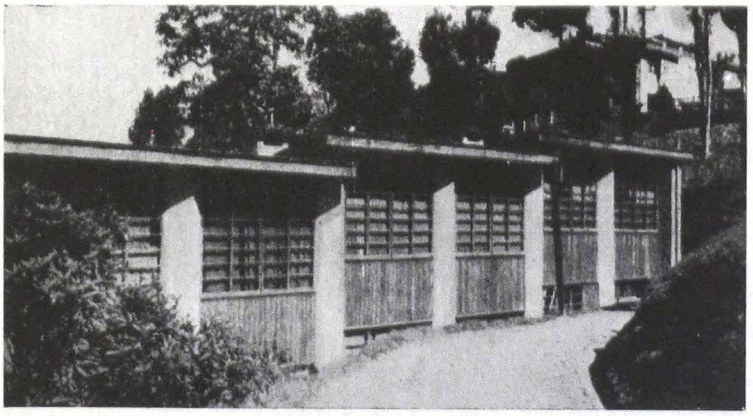
Shri Pasang Phuttar of the Sherpa Climbers' Association, Darjeeling

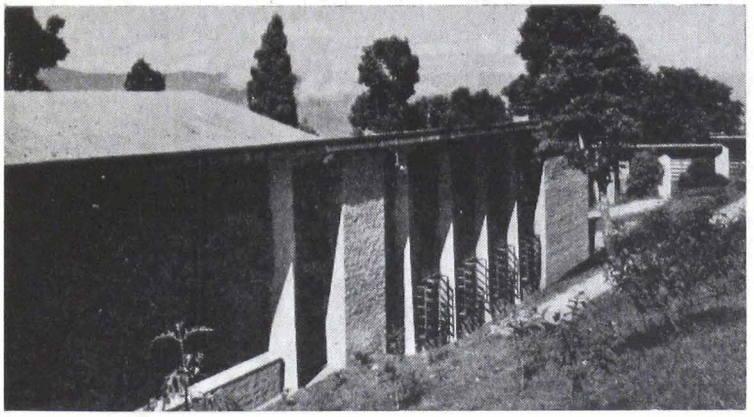
A Representative of the Nepal Government

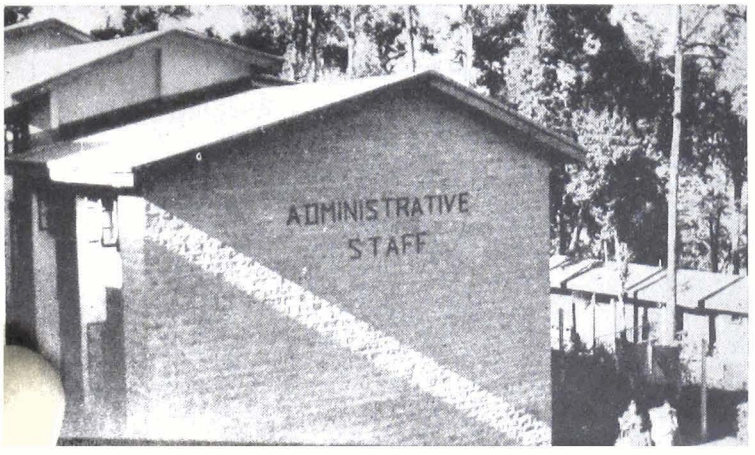
*Secretaries of the Council

A meeting of the Executive Council of the H.M.I. held at the Prime Minister's residence in Delhi





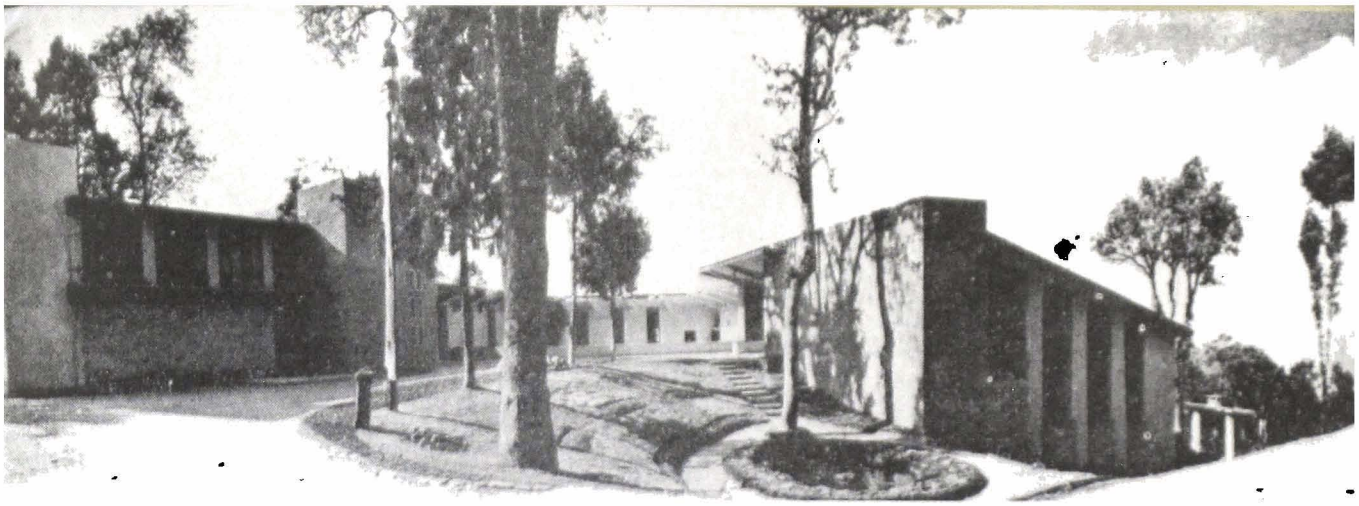




Exterior view of the Institute's Museum, which adjoins a well-equipped Library

←— Left, from top to bottom : (1) and (2) —Sherpa Villa and Sherpa Niwas (instructors' residential quarters), (3) — student trainees' hostel and (4) — administrative staff quarters

The life-size figure of a Sherpa climber in full mountaineering kit in the Museum



The administrative buildings of the Himalayan Mountaineering Institute, Darjeeling

ORIGIN AND GROWTH OF H.M.I.

"The lure of the Himalayas is spreading now all over India among our young people, and that is a sign and a symbol of the new life and the new spirit that is coursing through India's veins." —*Jawaharlal Nehru*

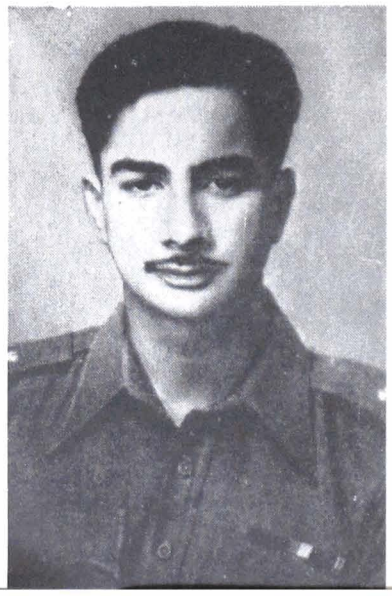
SHRI Tenzing Norgay's ascent of Everest (29,028 ft.), along with Sir Edmund Hillary, in 1953 provided a great impetus and fillip to mountaineering as a sport in India, and it was to commemorate this signal success that the Himalayan Mountaineering Institute (H.M.I.) was founded in Darjeeling in 1954.

The Swiss Foundation for Alpine Research was approached to prepare a scheme for the H.M.I., and Mr. Arnold Glatthard, Principal of the Swiss Mountaineering School, Rosenlaui, personally visited Darjeeling for this purpose. In company with the late Maj. N. D. Jayal, who took over as the first Principal of the Institute, and Shri Tenzing, he investigated possibilities for such training ground afforded by Darjeeling and Sikkim mountains. Thereafter, the Swiss Foundation made the following recommendation :

"It is indeed an excellent idea to include mountaineering in the physical fitness programme. A course of preparatory character should include lectures on geography, morphology, geology or physiology and climatology as suitable additions to the curriculum of students."

Mr. Glatthard recommended Dzongri, a place about 15,000 feet about sea-level in Sikkim mountains, for field training in mountaineering and the Birch Hill in Darjeeling as the site for the Institute.

Maj. N. D. Jayal



Intensive Courses

The basic and advance training courses of the Institute are intensive and comprehensive, giving trainees drawn from all walks of life an opportunity to develop their capacity and skill in mountain-climbing of all kinds.

The H.M.I. charges Rs. 420 per candidate for each of the basic and advance courses it runs. This is a highly-subsidised rate and covers all expenses on boarding, lodging, instruction, use of specialised mountaineering equipment and porterage and rations in the field. Candidates sponsored by the N.C.C. Directorate are not required to pay any fees, the expenditure in respect of them being shared by the Central and State Governments. The University Grants Commission has agreed to give 10 scholarships every year to university students to enable them to attend courses run by the H.M.I.

The minimum age-limit for admission to the Institute is 18 years and the maximum 40 years, the latter being relaxable in the case of candidates who are medically fit and possess previous experience of climbing or trekking in the mountains.

The Institute, which is housed in buildings perched on the western spur of the Birch Hill, about 6,800 feet above sea-level, has become an important centre of tourist attraction. It commands a magnificent panoramic view of the snow-covered massif of Kangchenjunga (28,208 ft.), the third highest peak in the world.

The H.M.I. is equipped with a

Brig. Gyan Singh

well-stocked library, which has now more than 500 books covering a wide range of subjects, including travels and explorations, astronomy, geology and flora and fauna. Valuable additions have been contributed from time to time by, among others, the Swiss Foundation for Alpine Research, the German Alpine Club, the French Mountaineering Federation, the Ski Club of Great Britain, the Alpine Clubs of Japan and Canada, the Everest Foundation of the U.K., Brig. Sir John Hunt and Gen. Bahadur Shamsher Jung Bahadur Rana of Nepal.

The Institute also has a museum, which has a relief model of the Himalayas coloured in various shades showing the principal peaks, a life-size model of a Sherpa in mountaineering kit, a case displaying badges and pins of mountaineering clubs all over the world, a collection of dresses of hill-folk in the Himalayas, flags and pennants planted on peaks climbed by Indian expeditions, charts and photographs showing the heights of peaks, and high-altitude birds, fishes and butterflies. The Institute's auditorium is named the Jayal Hall in memory of the first Principal, the late Maj. Jayal, who lost his life on the 1958 Cho-Oyu expedition.

Adjoining the administrative block is a building, designed on the model of Swiss youth hostels, that accommodates trainees. Two other buildings —Sherpa Villa and Sherpa Niwas— provide well-furnished living quarters for the instructional staff, while yet two others are intended for the administrative and clerical staff. There is also a Physiological Research Laboratory. Outstanding among them all is, of course, the Principal's bungalow, with a guest house, which combines to make the Institute a self-contained campus.

A Wild Life Park

An essential adjunct to the Institute, a Zoological Park, extending over an area of about 200 acres of wooded land comprising the Birch Hill and Lebong parks, is rapidly coming up. The project, which is supported by the Government of West Bengal, is scheduled to be completed by the end of the third Five-Year Plan and is estimated to cost Rs. 35 lakhs.

High-altitude animals and birds, mainly of Himalayan origin, will be kept in this open-air wild life park against a background of their appropriate floral associations in conditions corresponding to the natural habitat of its denizens. Those that have already arrived include four Himalayan bears, three Ussuri tigers, two leopards and four barking deers. This will enable students of the H.M.I. to study, at close quarters, the fauna and flora they may expect to come across at various altitudes in the mountains during treks undertaken by them.

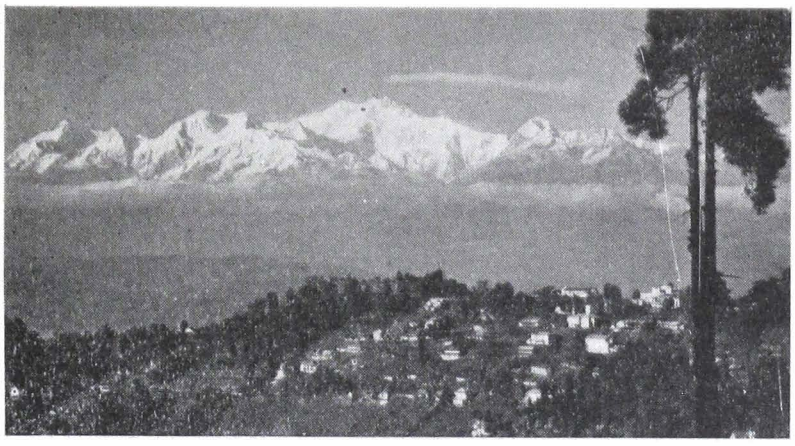
Besides Himalayan wild life, the park will acquire animals of the colder regions and construction work is now rapidly in progress to house these rare animals. A wing of this high-altitude park, perhaps the first of its kind in the world, will be devoted to higher research.

Corps of Instructors

The late Maj. Jayal, Shri Tenzing and Brig. Gyan Singh, the present Principal, have all striven to build up the Institute to its present stature and eminence. Since its inception, the institution has gradually formed and moulded a corps of instructors who have taken part in many an expedition. Besides Shri Tenzing, who is Chief Instructor and Director of Field Training, the Institute at present has half a dozen other highly-proficient Sherpa instructors.

Up to the end of 1961, a score of Indian expeditions to the Himalayas had been organised, including one to Everest, and more than 15 of these were successful. Most of the mountaineers who participated in these expeditions were ex-students of the H.M.I.

Within the short space of its existence, the Institute has been able to carve out a niche in the hearts of mountaineers all over the world. Among the distinguished climbers who have evinced keen interest in the well-being of this Institute are Mr. Ernest Feuz, Secretary-General of the Swiss Foundation for Alpine Research, Mr. Jean Franco, Director of the French Mountaineering and Ski School, Sir John Hunt, Dr. Charles Evans and Mr. George Band. The Institute has been visited by many foreign mountaineers, including Sir E. P. Hillary.



Kangchenjunga (28,208 ft.) as seen from Darjeeling

Queen of Hill Stations

Home of the H.M.I. and acclaimed as the "Queen of Hill Stations", Darjeeling is accessible from all parts of India by rail, road and air, the Siliguri rail-head and the Bagdogra airport being its vital links with Calcutta and the outside world. Situated at a height of 7,000 feet, it is a little more than 400 miles north of Calcutta. A short air-hop of about two hours takes one from Calcutta to the mountain-base airfield of Bagdogra, from where it is less than 60 miles. This last lap of the journey —a zigzag ascent—can be covered either by road or by the romantic toy train of the Hill Railway from nearby Siliguri.

Though enjoying all the amenities of city life, Darjeeling, with its interesting folks—Lepchas, Bhotias, Tibetans and Nepalese—has a hill-station glamour of its own. From its dominating position, about 8,500 feet high, the Tiger Hill affords a picturesque gold-and-silver view of the perpetual snows in the far distance culminating in Kangchenjunga, while watching the gorgeous sunrise from here is something unforgettable. Nearly 150 miles away, Everest, towering high up in all its pristine glory, is visible in glimpses from here on a mistless day.

(Left)—Student trainees crossing a moraine near the base camp to reach the ice-craft training area. (Right)—Students of the basic course receiving training in rock-climbing.

SCOPE OF TRAINING PROGRAMME

"There will be no lack of adventures of the mind and body for those who are prepared to venture into uncharted seas and climb unknown peaks of human endeavour."

—Jawaharlal Nehru

IT is difficult for the uninitiated to understand fully the benefits derived from mountaineering. It is an open-air activity requiring the very best of mental, moral and physical fitness.

More than anything else, mountaineering demands self-reliance and self-confidence, an adventurous spirit, readiness to take risks, tremendous endurance and stamina and firm perseverance and determination. It is a form of sport in which material gain may be negligible; one has to toil up the gradient towards an ever-receding objective with an iron will and resolve to triumph in the face of overwhelming odds.

Essential Qualities

The greatest advantage of all is gained from the impact on the mind of a student of the symbolic aspect of mountaineering, i.e. the feeling of rising higher and higher and overcoming all obstacles that bar the way. Whether he climbs in a party or by himself, he is subjected to a very searching test; the reserves of his courage and fortitude are called in and any pretence or hypocrisy is stripped away in the face of danger.

A mountaineer is always the gainer even though he may not reach the summit—he learns to appreciate the virtue of sacrifice, the value of physical exertion, and, above all, the spirit of camaraderie.

It is not claimed that it is mountaineering alone that can accomplish all this; it can be sailing in the open sea, exploration in the polar regions and such other adventures in which the difficulties to be encountered appear almost insurmountable. In all these, men can have 'victory without pride' and 'defeat without despair', bereft of the psychological consequences inevitably attendant upon victory and defeat in competition with fellow human beings.

No effort is spared at the Himalayan Mountaineering Institute to cultivate all these essential traits and qualities among its students. The aspiring mountaineer is conditioned and shaped here by a tough basic course lasting 42 days, 28 of which are spent in the mountains up to 20,000 feet in altitude. Selected students graded high are encouraged to take an advance course.

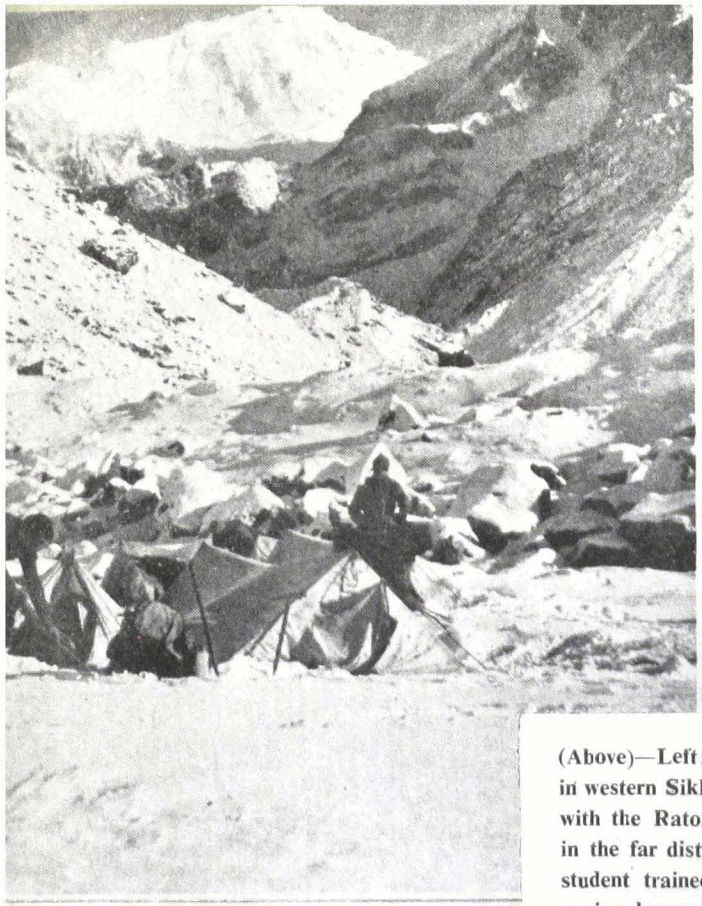
Shri Tenzing Norgay, Director of Field Training

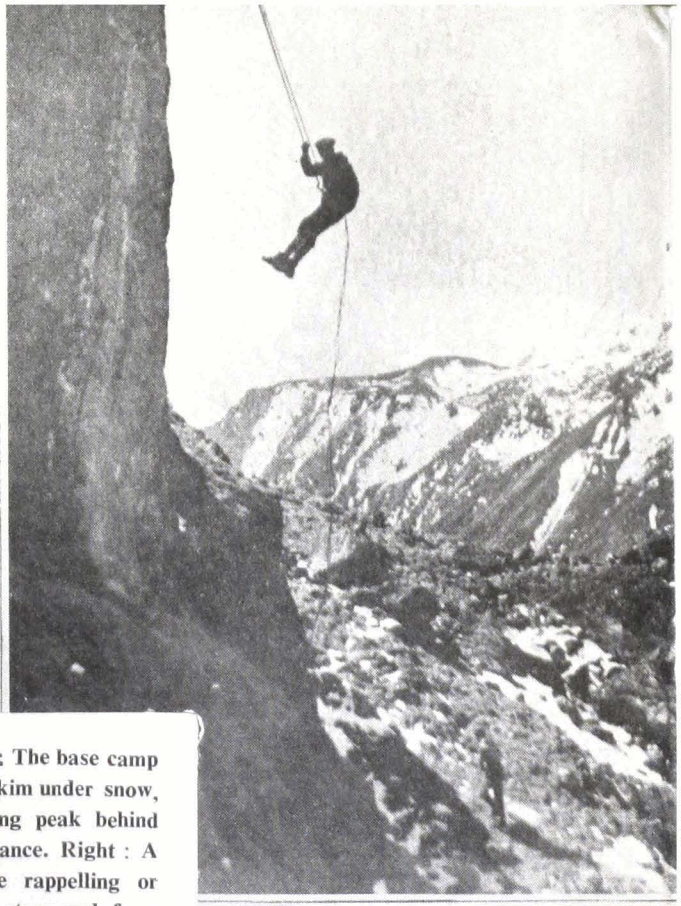
Although the training imparted at the Institute is undoubtedly of value to the physique, it does not aim at producing athletes or gymnasts. It helps students to shake off exclusiveness of mind and narrowness of outlook. Apart from technical training in mountain-climbing, emphasis is laid on discipline, character-building and leadership. The self-discipline imposed on treks and expeditions, which involve living in a restricted society under great hardships, though with the noble purpose of looking after the safety and comfort of others, is of lasting value.

Providing Stimulus

Mountains have inspired and raised to great emotional heights men of science, thought and letters, like Dante, Rousseau, Goethe, Wordsworth, Keats, Ruskin and Tagore. Though not many can hope to rise to these heights, the H.M.I. believes it can provide the necessary stimulus to those who are gifted with idealism and urge them on to a higher purpose.

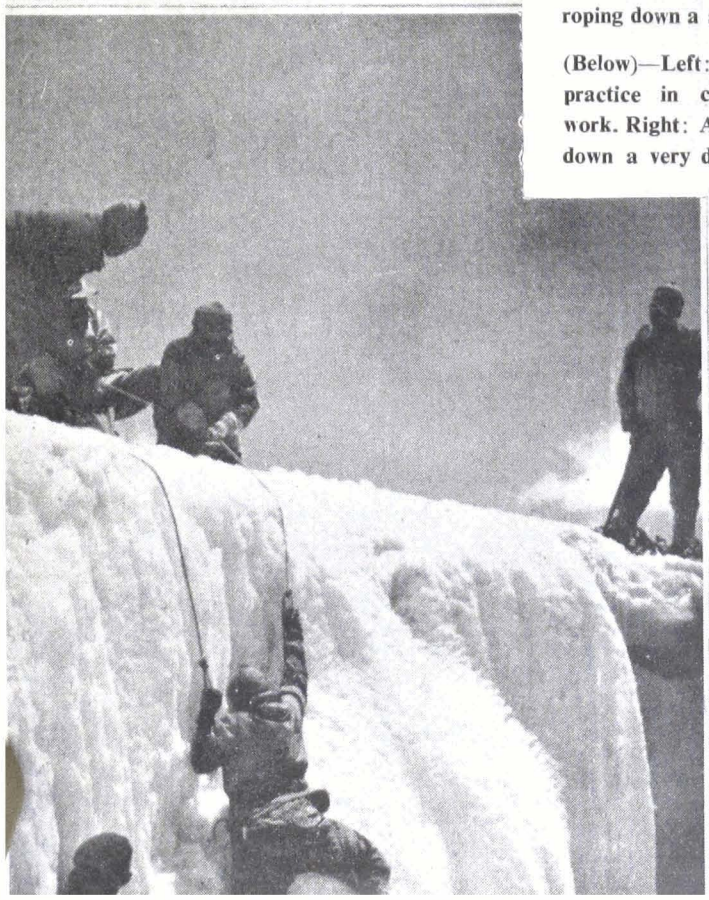
The basic course—organised four times a year, i.e. in March-April, April-May, September-October and November-December—is usually categorised in accordance with the educational qualifications of students

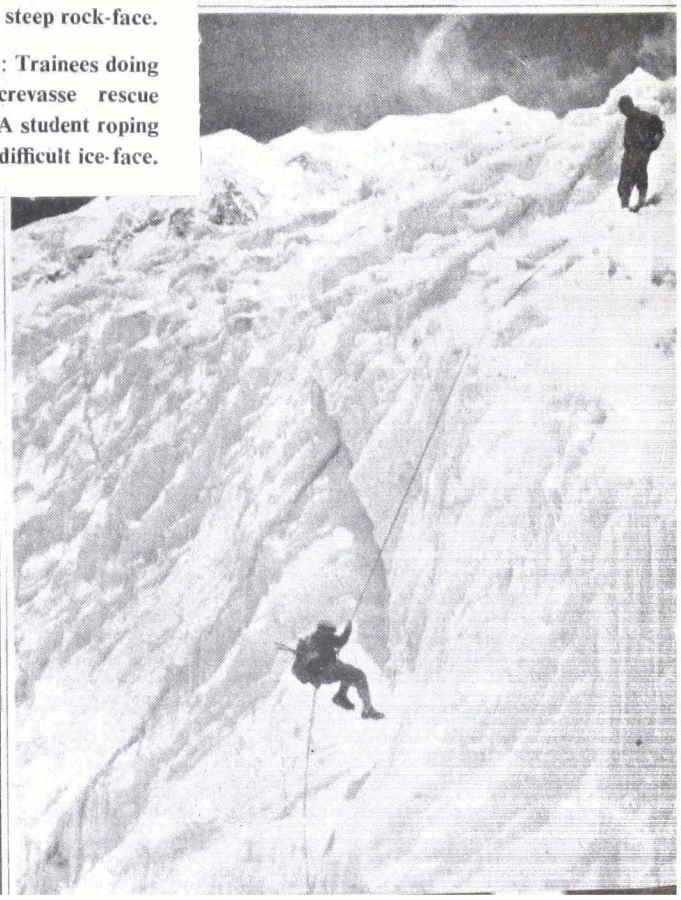




(Above)—Left; The base camp in western Sikkim under snow, with the Ratong peak behind in the far distance. Right : A student trainee rappelling or roping down a steep rock-face.

(Below)—Left: Trainees doing practice in crevasse rescue work. Right: A student roping down a very difficult ice-face.





joining the Institute thus:

Course (A)—For those who have passed the Matriculation Examination or the Senior Certificate Examination of Cambridge University (three such courses are held every year).

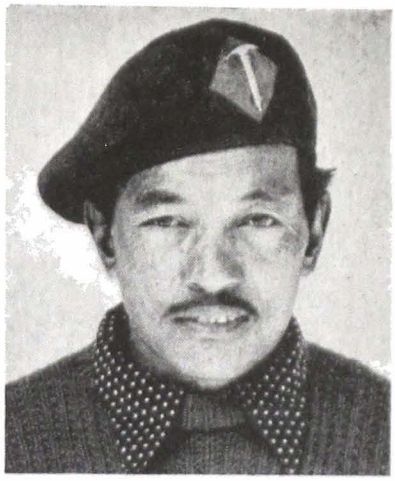
Course (B)—For those whose educational standard is distinctly lower (one such course is run every year).

The number of students per course is normally 24.

Each course is divided as follows:

(a) *Period of Acclimatisation* : During the first ten days of the 42-day training, students get themselves acclimatised in Darjeeling and its surroundings. They have physical training every morning and go on progressively longer marches, carrying increasingly heavier loads in their ruck-sacks. Lectures on various aspects of mountaineering as well as general hygiene, high-altitude physiology and first-aid are delivered. Students and visiting lecturers give talks on the history of mountaineering in the Himalayas and the Alps, the geology of the Himalayas, glaciology, mountain flora and fauna, folk-lore, map-reading and meteorology. During this short period, it is possible only to touch upon the fringes of these subjects, but students can learn enough to be able to take an interest in their surroundings when they are in the mountains. Mountaineering equipment is issued and instruction in the theory and practice of setting it up and handling and preserving it with care is imparted.

(b) *Trek Out to Base Camp* : It takes nine days to reach the base camp in Western Sikkim, a beautiful place approximately 60 miles from Darjeeling. Students have to carry a load of 25 to 30 lbs. in their ruck-sacks. They take two days' rest on the way in order to acclimatise themselves to higher altitudes. They sleep in tents which they have to pitch themselves.



Senior Instructor Gyalzen Mickchen of H.M.I.

Instructor Da Namgyal

(c) *Field Training in Camp:* The next 12 days are spent at the base camp. During their daily climbs from this camp, students are given practical training in rock-climbing as well as ice and snow-craft, roping down on vertical rock and ice-faces, step-cutting on ice, crevasse rescue and glacier work. Lectures are delivered round evening camp fires to elucidate these various aspects of training. Students, at this stage, have an opportunity to climb up to 20,000 feet.

(d) *Return March to Darjeeling* : The return march to Darjeeling is sometimes by a different route skirting the borders of Sikkim, Nepal and India. The route is longer but more beautiful and enjoyable than the one out, and only toughened-up mountaineers can do it in lesser time—seven days—, carrying up to 40 lbs. in their ruck-sacks. A collection of geological and botanical specimens are brought back for the H.M.I. Museum.

(e) *Short Stay at Darjeeling*: The last four days of the course are spent in maintaining and handing back all the equipment. Students have also to appear for a small practical test. There is a graduation ceremony, when a silver replica of the ice-axe is pinned on the jerseys of successful candidates. Thereafter, the course disperses.

The basic course thus initiates

Below, from left to right : Instructors Ang Temba, Nawang Gombu, Tashi and Wangdi of the Institute

Left : At the graduation ceremony of the 25th basic and 7th advance courses of the Institute, a student receiving a pocket badge from the Prime Minister. Right : The Prime Minister addressing graduates of the advance course.

students to the mountains and mountaineering as a sport, introduces them to subjects allied to mountaineering, teaches them elementary rock-climbing and snow and ice-craft and ends up in climbing a peak of 18,000 to 20,000 feet.

Aims of Basic Course

The objects of the basic course are

(1) to create a correct attitude in students so that they may view mountaineering as an art and not purely as a physical activity,

(2) to stimulate in them a desire for mountaineering expeditions and exploration of unknown areas, so as to create among them an incentive to endeavour,

(3) to teach them, in outline, scientific subjects dealing with all aspects of the mountains and mountaineering,

(4) to make available to students suitable relevant literature and reading material,

(5) to teach them how to make themselves comfortable and preserve their health in new environments,

(6) to toughen up their bodies, thereby increasing their resistance to cold, hunger and fatigue, and

(7) to teach students both theoretical and practical mountaineering techniques.

It is not possible to measure changes in character by any statistical yardstick. Nevertheless, it has been found that those who have taken this course have been influenced in their attitude towards life by readily undertaking responsibility, surmounting fear, working as a team and learning to know how others live. They have conformed to the code of honour and behaviour on which good citizenship is based. The proud is humbled, the timid is encouraged, while the shirker and the leader are equally revealed. Self-confidence grows, life

is given a purpose and a sense of service is developed in them.

Women's Training

In response to persistent demand, a separate basic course for 24 young women was specially conducted by the Institute in April-May 1961 for the first time. They were given training in rock-climbing, ice and snow-craft, roping down vertical snow and ice-faces and crevasse rescue. The second course for girls will be held in April-May 1962.

In a message of congratulations sent on the occasion of the graduation ceremony, Shrimati Padmaja Naidu, Governor of West Bengal, said, ".....I was interested to find that young women, coming from all parts of the country, were all united in their determination to prove that, given the opportunity, they could prove as capable of surmounting the hazards of mountaineering as men have proved themselves to be....."

The Defence Minister, Shri V. K. Krishna Menon, said, ".....Coming from all parts of India, these women have presented in their composition the vast diversity and richness of our country. They have also borne witness to the fact that women can share a place of pride in sport as in other aspects of our national awakening which thus stand proclaimed to ourselves and the world."

Students' Impressions

Here are some extracts from men students' impressions of the mountains, which show how the impact of Nature has moulded their character and they have returned visibly reorientated in their outlook : "They have taught me to be unselfish and resolute" ..... "The craving of being in the mountains persists; I will be back soon to drink deep the immense pleasure they offer"....."When face to face with Nature, one realises one's limitations"....."One's power of endurance and fortitude is increased to the maximum"....."I have found deep contentment in the mountains because my mind was diverted from the pettiness of daily life to the grandeur of Nature"....."I have seen the mountains in their pristine glory" ....."Out of the man-made world, I came to the lap of Nature"..... "Being in the mountains has made me realise their infinity and my finality, their vastness and my smallness; it has taught me how to live together, to live not for oneself but for the common good"....."Above all, one is spiritually elevated under their sublime influence"....."The mountains inspire something divine and broaden the sphere of thinking" ....."I was drawn to the mountains by some powerful urge which ultimately surrounds one's physical and mental shortcomings, which in itself I consider a purpose worth its pursuit"....."Character is not taught but formed in the manifold interchanges of adventurous experiences

in the mountains"......"Hardships and hazards did come my way but, shared with others, they have left pleasant memories; they have created friendly ties."

The following are some typical extracts from the impressions recorded by women students: "It is only in the mountains that real tranquility and contentment can dawn upon man".. ....."The mountains have arrogantly shown me my limitations and pointed out how inconspicuously small I really am"....."If I have hitherto been proud of my little achievements, after coming to the mountains I have realised that they are not even a drop in the mighty ocean"....."Their magnanimity and grandeur have made me aware our insipidity and insignificance" of..... ..."There is always peace of mind in the mountains, and every minute made me think of God" ....."A trip to the mountains develops courage and faith in self, teaches us endurance, tolerance, patience, comradeship, team-spirit and the value of physical exertion".

Advance Course

The advance course is designed to give further experience to those who have already done the basic course. It helps to organise climbs on peaks of over 20,000 feet or, alternatively, to explore hitherto unvisited or scientifically unexplored areas in the Himalayas and to bring

back information of scientific value. Beginning with ropes and knots, the course progresses through rock-climbing, ice and snow-craft (including movement on ice by cutting steps), and roping down on rock-faces and ice-walls.

Previously, advanced courses were held every year and were in the nature of expeditions to various peaks—Kamet (25,447 ft.) and Abi-Gamin (24,130 ft.) in 1955, Saser Kangri (25,170 ft.) and Sakang (24,150 ft.) in 1956, and Nanda Devi (25,645 ft.) in 1957. Of these, the expeditions to Kamet, Sakang and Abi-Gamin were successful.

Thereafter, it was decided to send advance course expeditions every alternate year. In 1959, an advance course was undertaken in the Kabru region in Western Sikkim in the same area as the basic course. Participants in this course formed the panel from which members of the Everest expedition in 1960 were eventually selected.

It has since been decided to train students of the advance course along with those of the basic course, thereby giving a chance to many more young men to enlarge their experience in the mountains. Advance course students are selected from among those who have done well previously in the basic course.

There has thus been a radical change in the running of advance courses from 1960. Instead of one advance course every alternate year, advance courses are now being held four times a year, each along with a basic course.

Potential Leaders

The advanced course aims at (a) producing potential leaders of expeditions, (b) training in advanced techniques of mountain-climbing, particularly on an icefall, (c) acclimatisation for high altitudes by staying out in camps at 17,000 to 18,000 feet, (d) practising high-altitude climbing

Students of the first women's basic course of the Institute that was held in April-May 1961

on one, two or more peaks in the Kabru area, and (e) academic exercise in the organisational planning of a major expedition.

Supervised by the hawk-eyed instructors, whose instinct for spotting weaknesses in technique borders on the meticulous, students can ill-afford any indifferent performance during their training.

700 Students Trained

Up to the end of 1961, the H.M.I. had trained 700 students drawn from different walks of life and all of them returned to their callings with the infinite beauty of the mountains leaving an indelible imprint on them. Of these, 632 were basic and 68 advance course students.

The Statewise breakdown of students up to the twenty-seventh basic course held in September-October, 1961, was: Andhra 16, Assam 12, Bihar 18, Delhi 25, Gujerat 33, Himachal Pradesh 23, Kashmir 5, Kerala 10, Madhya Pradesh 13, Madras 11, Maharashtra 35, Mysore 10, Orissa 7, Punjab 82, Rajasthan 22, Uttar Pradesh 122, West Bengal 151, Sikkim 10 and Nepal 3, the total being 608. Sixty-two students were trained in advance courses up to September-October.

At the end of each course a report, based on tests and observations, is compiled and sent to the sponsors of students. These reports are of immense value as they provide an unbiased appreciation of the potentialities of students. Students are also encouraged to write a report on their experiences on which comments and criticisms are welcomed.

Women trainees learning to handle the rope, the mountaineer's life-line

On completing the basic course, a student is awarded the silver ice-axe, while on passing the advance course a trainee is presented a pocket badge having the emblem of the Institute.

Rock-Climbing Courses

Though the need to encourage mountaineering as a character-building activity for youth is now well-recognised, the vast distances of the Himalayas from Central, Western and Southern India have been a handicap in the way of its popularisation on a countrywide scale.

Though trekking and small expeditions to a few peaks in the Himalayas may be feasible once in a while, such intermittent opportunities are insufficient to sustain interest in this outdoor sport in the far-flung parts of the country. Though this is understandable, mountaineering in the shape of rock-climbing is certainly practicable in the lower mountain ranges and can become a valuable means of intiating young men and women into this sport and generating a healthy movement of "the mountains for the millions".

As there is ample scope for practising rock-climbing all over India, the H.M.I. sends out its trained Sherpa instructors to all parts of the country during their off-season in winter to teach beginners the techniques of rock-climbing in the hills. This the Institute undertakes to do on the condition that local organisations make themselves responsible for holding courses and meeting the travelling and other expenses of the instructors during their stay outside Darjeeling.

Held In Many States

Rock-climbing courses have been held in several States, covering the basic principles of rappelling on vertical rocks, chimney-climbing, ascending a pinnacle and crevice-crossing. They have so far been organised in the States of Maharashtra Madhya Pradesh, Rajasthan, Uttar Pradesh, Jammu and Kashmir, West Bengal, Punjab and Kerala.

India-made items of mountaineering equipment **(see pages 22 and 23)**

PHYSIOLOGICAL RESEARCH SECTION

"The mountains have a mysterious way of getting the best out of man... There is no other pursuit which brings about such complete physical, mental, emotional and spiritual integration as mountaineering."

— Gyan Singh

With the setting up of the Himalayan Mountaineering Institute, mountain-climbing in India has been looked upon not only as an adventure but also as a source of scientific studies. It provides ample food for the physiologist, the botanist, the meteorologist and the geologist alike. No facilities for such research work existed in India until recently.

The adaptation of the human body to low atmospheric pressure and reduced oxygen tension has interested physiologists all over the world. Scientific researches for investigating the effect of hypoxia on the human system have been conducted in Europe since 1783, with man subjecting himself to high-altitude anoxic conditions not only by climbing the mountains but also by going up in balloons and aeroplanes.

Insufficient Data

Though a certain amount of systematic work has been carried out in high-altitude laboratories in other parts of the world, it cannot yet be said to be sufficiently advanced.

Mountaineers both from Western and Eastern countries have organised several expeditions in the Himalayas and other mountain ranges in Europe and elsewhere since 1904, but physiological research has been done only on a few occasions. Therefore, the data collected so far has been rather meagre and inconclusive. The main reasons for this were as under:

(a) Mountaineering in the Alps and other comparatively low-altitude mountains in the Western countries does not impose unduly low atmospheric pressure conditions.

(b) Although most of the expeditions in the Himalayas had doctors with them, only a small number had trained physiologists or equipment to carry out experiments.

(c) As members of expeditions had always been picked men who had undergone continuous training and acclimatisation at high altitudes, the findings of physiologists accompanying them could not be applied to others who had previously not done any mountaineering.

(d) No progressive study of physiological changes during acclimatisation at high altitudes has so far been properly carried out.

How One Feels On Mountain Top

"On a mountain-top a man feels himself to be no interloper on life's stage, no temporary improvisation to suit an obscure purpose, but an entity whose span is timeless, whose scope is magnificent beyond conception, whose birth and death are incidental milestones on a splendid road without beginning and without end."

— Frank S. Smythe

Human Physiology

Hill-folk living in the Himalayas are already fully acclimatised, but people from the plains have to be given proper training in the technique of mountaineering. This work cannot be done haphazardly; doctors and physiologists have to supervise the acclimatisation process. In order to do this, they must study human physiology at high altitudes pertaining to people with different food habits living in different climatic and

Pictures below, taken during the 1960 Everest expedition, show (left) a climber taking a calcium injection and (right) a member being treated for cough and cold

environmental conditions.

A Physiological Research Section was set up at the H.M.I. in 1960 and a trained officer of the Army Medical Corps has been posted as doctor-cum-physiologist in charge of it. Dr. Hiralal Saha, Professor of Physiology, Nilratan Sircar Medical College, Calcutta, has been appointed Honorary Physiological Adviser to the Institute. The Research Section has two laboratories, one static in Darjeeling and the other portable for high altitudes to accompany training courses and expeditions, if necessary.

Objects of Study

The Research Section aims at studying the

(a) effect of anoxia on the human body, especially on respiratory, cardio-vascular and nervous systems and metabolism,

(b) oxygen consumption, energy expenditure and efficiency of climbing with loads and without them (with men of different body size and food habits) at various altitudes in the mountains,

(c) response to physical activity at various altitudes by pulmonary ventilation, maximum expiratory flow, pressure in relation to oxygen requirement, and mechanism of conservation of heat,

(d) lactic acid mechanism and certain properties of blood in relation to exercise on high altitudes,

(e) changes in human behaviour at high altitudes,

(f) increase of resistance to lack of oxygen in men on certain diets, vegetarian or non-vegetarian,

(g) influence of Vitamins B (Complex), C, A and D on resistance to high-altitude medical hazards,

(h) effects of extreme cold and solar radiation on the body at high altitudes, and

(i) special problems of food, equipment and clothing in mountaineering.

HIMALAYAN INSPIRATION

By inspiring those that come to them with all their traditions in Indian history and culture, humbling them with their vastness and power, satisfying them with their grandeur, trying their manhood with their glaciers and peaks, challenging their spirits with their inviolate secrets and showing that God exists not only in the beauty of his creations in Nature but also in the spontaneously noble actions of their companions, the Himalayas will forge men who, when they come back to everyday life, will do so with a changed perspective, ignoring all the petty, trivial and unimportant things that normally take so much of their energy and time and concentrating on problems that really matter.

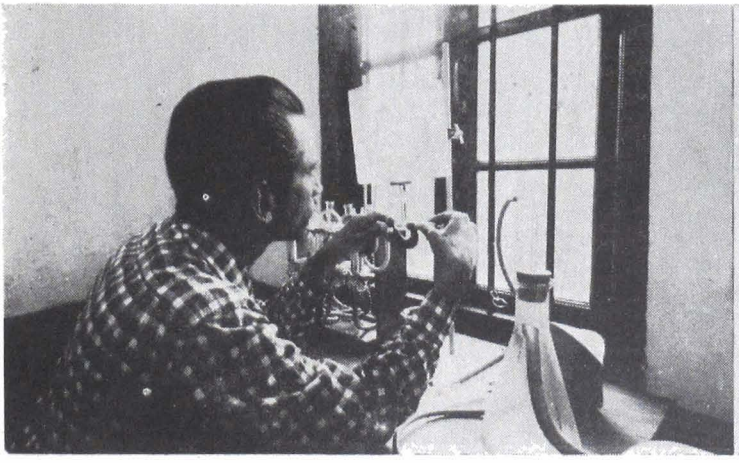
—N. D. Jayal

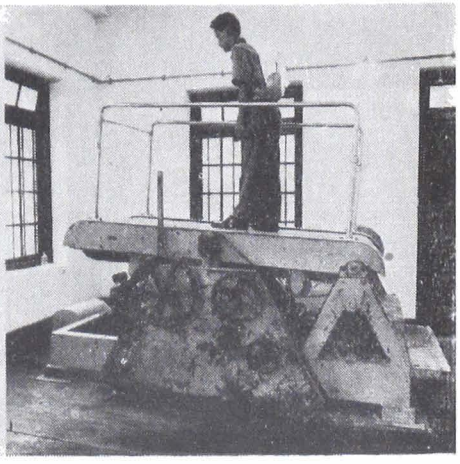
TREADMILL

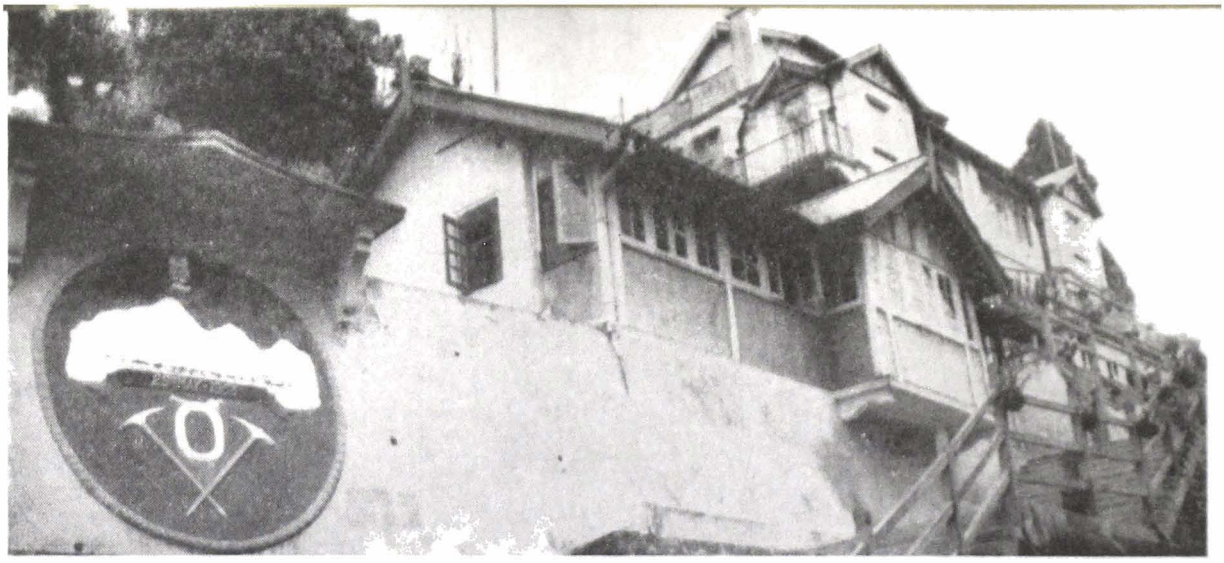
Picture below shows the Treadmill consisting of a revolving belt whose speed can be varied. Required to move in the opposite direction on the belt, an individual can have his or her calorific requirements evaluated and fatigue and other stresses on the human body tested.

The appliance provides graduated exercises, like marching in the mountains at various speeds and at different gradients, under simulated conditions.

Capt. (Dr.) S. K. Das carrying out an experiment on the Scholander microgas analysis apparatus at the Physiological Research Laboratory







The residence of the Everest hero and President of the S.C.A., Shri Tenzing Norgay, in Darjeeling

SHERPA CLIMBERS' ASSOCIATION

"He who appreciates Nature learns to unburden his mind of trivial thoughts."

—Frank Smythe

SHERPAS have always held a unique position in the hearts of all mountaineers, particularly those connected with the Himalayas.

It was only after his momentous ascent of Mount Everest in 1953 that Shri Tenzing Norgay thought it was time something concrete emerged from his newly-acquired eminence and popularity. It had been his long-cherished desire to ameliorate the condition of his fellowmen so that they could fend for themselves. He was also anxious that expeditions which hired Sherpas should have trustworthy, reliable and efficient men who not only loved the mountains but also knew its vagaries —its tempestuous moods of grandeur and tranquillity. So, in 1955 he founded the Sherpa Climbers' Association (S.C.A.) in Darjeeling, whose primary object is to promote the welfare and well-being of climbing Sherpas.

A Fund for Tenzing

The *Statesman*, Calcutta, had opened a fund to raise money sufficient to enable Shri Tenzing, who had teamed with Sir Edmund Hillary to get to the top of the world, to build a home in Darjeeling. The response was so generous that the fund was closed with an amount well in excess of its original target.

The *Statesman* handed over the surplus amount to the Himalayan Club to be utilised for the general betterment of needy Sherpas. In order best to serve the cause, the Club decided to create a Sherpa Trust. Later on, with the founding of the S.C.A., with Shri Tenzing as its President, it was felt that the tasks of the Trust and those of the Association were directed towards identical objects. Therefore, the Trust was wound up in November 1958 and its funds were transferred to the S.C.A.

Apart from getting Sherpas a square deal, the S.C.A. has pledged itself to expeditions that it would select men who are thoroughly dependable and experienced climbers. It undertakes to train a sufficient number of guides and high-altitude Sherpas for the purpose. It also aims at coming to Sherpas' succour in times of illness or financial plight and taking care of them in their old age.

Finally, the Association expects Sherpas, who have all been brought up the hard way, to excel in the profession that would make them proud of the Sherpa climbers' badge—which might one day become the hallmark of all the best climbers —an insignia as cherished and prized as the Chamonix guide badge.

TIGER BADGE

Sherpas have often been heroes of Himalayan expeditions of which there was a spate after World War I. It was to immortalise these acts of courage and endurance that the Himalayan Club instituted the 'Tiger Badge, which symbolises for the Sherpa climber what the gold medal does for the athlete.

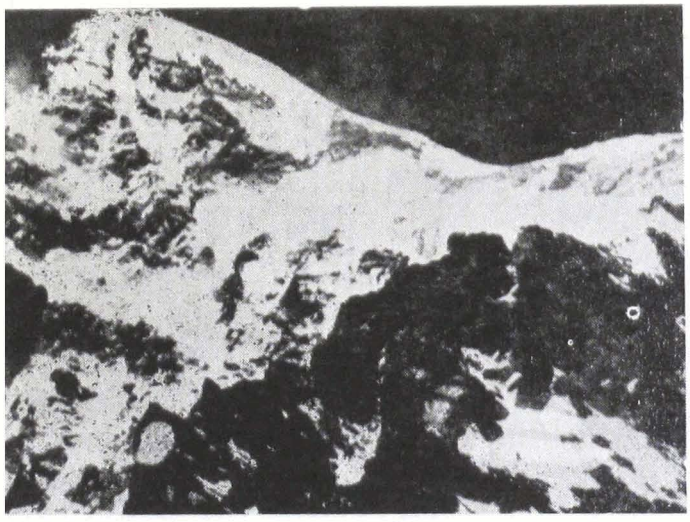
The first 'Tiger' Badge was awarded in 1935.

Assistance By H.M.I.

The Himalayan Mountaineering Institute has also paid due attention to the advancement of Sherpas. It has trained selected Sherpas free of charge, given them employment at the Institute and provided them accommodation with modern facilities. It has set up in its premises a Coffee House which is run by the S.C.A. A part of the income from the fee for entrance to the Museum is set apart for providing amenities to Sherpas.

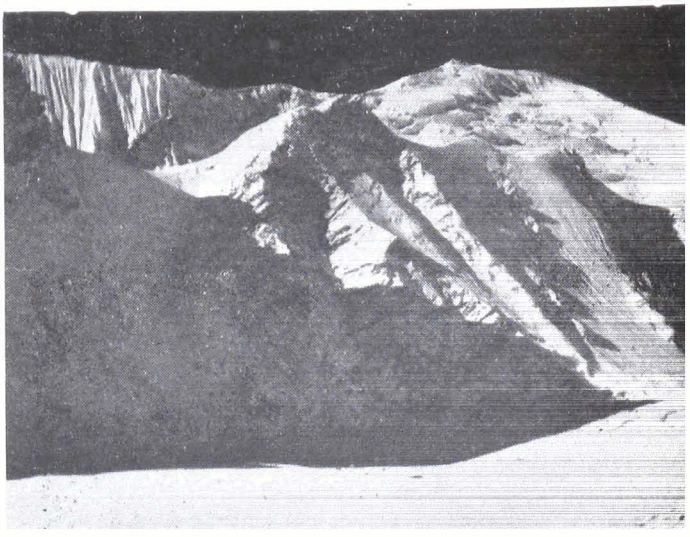
Left: Cho-Oyu (26,750 ft.,), Right: Trisul (23,360.)

← Kamet (25,447.)



Annapurna III (24,858 ft.) →

Left: Nilakantha (21,640 ft.), Right: Nanda-Ghunti (20,700 ft.)



THE MOUNTAINEERING FOUNDATION

"Mountain-climbing has always been a struggle between man and Nature, but a struggle, nevertheless, with a beloved opponent, a struggle with something greater than oneself, carried on with all respect and in all humility."
— Ruedi Schatz

AN Indian Mountaineering Foundation (I.M.F.) was established recently to produce good mountaineers in the country.

The Foundation actually took its birth in 1957 in the form of the Sponsoring Committee of the Cho-Oyu Expedition, the success of which in 1958 encouraged it to sponsor more expeditions. In 1959, it changed its name to the Sponsoring Committee of the Everest Expedition. Early this year it constituted itself into a permanent organisation, assuming its present nomenclature, with headquarters in the Capital, to sponsor Indian expeditions to the Himalayas from time to time.

Principal Objects

The principal objects for which the Foundation has been set up are

(a) to organise, support and provide a base for expeditions for mountaineering, ski-ing, rock-climbing and trekking at high altitudes,
(b) to propose and execute schemes for making people interested in mountaineering, exploration and all other connected subjects, including surveys of mountain regions,
(c) to extend scientific knowledge of the Himalayas and other mountainous regions,
(d) to have books, journals, magazines and maps published and slides, film-strips and motion pictures prepared on mountaineering and its different aspects,
(e) to promote research on human physiology and on food-stuffs suitable at high altitudes,
(f) to help indigenous manufacture of equipment, clothing articles and apparatus needed on mountaineering expeditions,
(g) to encourage formation of clubs, societies and institutions having similar objects and recognise and affiliate mountaineering organisations,
(h) to send selected representatives to other countries for training in mountaineering and invite foreign experts to attend conferences and deliver lectures on mountaineering,
(i) to reward outstanding efforts in the field of mountaineering suitably, and
(j) to render financial assistance to indigent mountaineers for medical treatment if they contract any diseases attributable to expeditions.

The Foundation now consists of Shri S. S. Khera, Secretary, Department of Mines and Fuel, Ministry of S., M. and F., as Chairman, Shri S. Boothalingam, Secretary, Department of Expenditure, Ministry of Finance, Prof. M. S. Thacker, Secretary, Ministry of Scientific Research and Cultural Affairs, Shri M. L. Khaitan (Messrs. Bata Shoe Co., Calcutta), Shri H.C. Sarin, Joint Secretary, Ministry of Defence, Shri A. K. Ghosh, Joint Secretary, Ministry of S. R. & C. A., and Shri M.G. Raja Ram, Joint Secretary, Ministry of S.R. and C.A., as members, and Shri K. P. Sharma as Secretary. Of these, Prof. Thacker, Shri Khaitan and Shri Sarin are members of the H.M.I. Executive Council.

A Decade's Record

The towering craggy heights of the Himalayas, with their perennial charm, have goaded Indians during the past decade to go after both scaled and unscaled peaks. While some of these expeditions were sponsored by the I.M.F., the others were either arranged independently or financed by private organisations.

The first of the Indian expeditions, though one of its four members was an Englishman (Mr. Roy Greenwood), was organised by Shri Gurdial Singh in the Garhwal-Kumaon Himalaya in 1951, and it climbed Trisul on June 23, they both reaching the top with Dawa Thondup. The peak was first scaled as far back as on June 12, 1907, by

1962 Everest Team

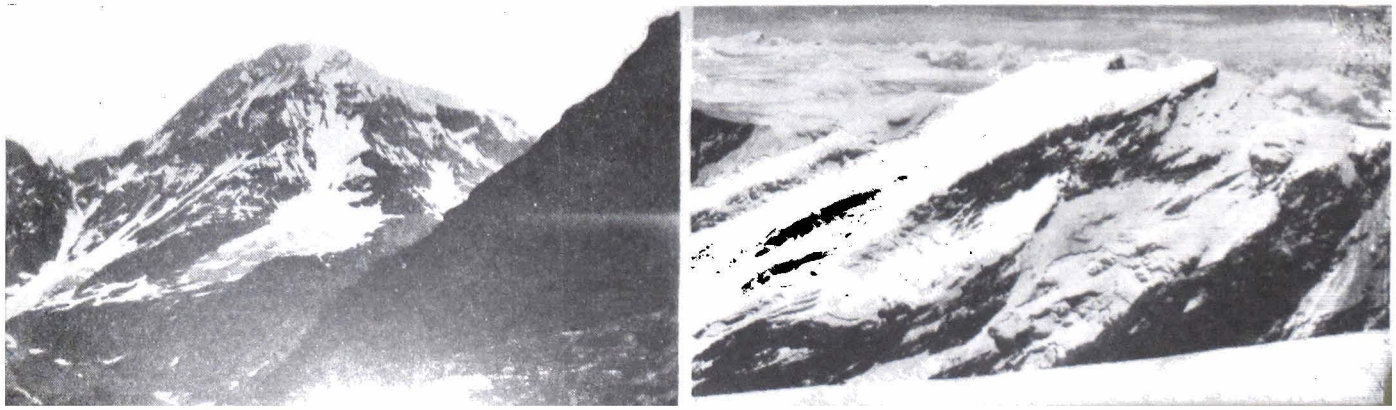
Major John D. Dias of the Garhwal Rifles has been chosen leader and Instructor-Lt. M. S. Kohli of the Navy deputy leader of the Indian expedition to Everest in 1962.

The other members of the team will be Shri Gurdial Singh, Capt. Narinder Kumar, Shri Sonam Gyatso, Shri O. P. Sharma, Shri C. P. Vohra, Capt. A. B. Jungalwala, Flight-Lt. A. K. Chowdhury, Shri K. P. Sharma, Shri Hari Dang and Shri Suman Dubey.

The doctors will be Dr. A.N.D Nanavati and Maj.M.A. Soares.

(Portraits on Pages 18 and 19)

Left: Nanda-Kot (22,510 ft.) and Right: Mrigthuni (22,490 ft.)



A stretch of steep ice above Camp II on Maiktoli (1961)

Preparing tent platforms at Camp IV on Kamet (1955)

Dr. T.G. Longstaff and A. and H. Brocherel and a second time in 1933 by Lt. P.R. Oliver.

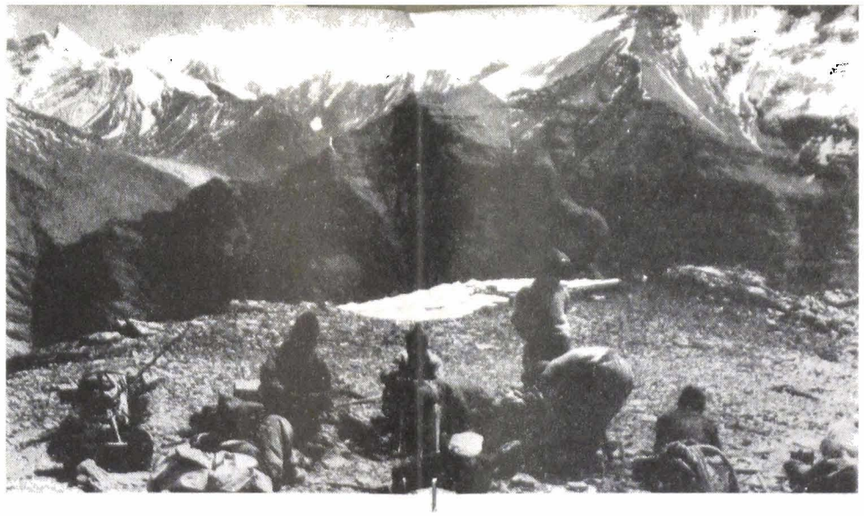
After an unsuccessful attempt in 1952, a four-member team under Shri P.N. Nikore ascended Panch-Chuli (22,650 ft.) from the south-west on May 27, 1953, the leader alone reaching the peak. Three earlier expeditions by foreigners—a Scottish led by Mr. W.H. Murray and a British organised by Mr. K. Snelson from the north side in 1950, and an Austro-German headed by Mr. H. Harrer from the south-west side in 1951—had failed.

Jayal's Repeated Bids

An expedition led by Maj. N.D. Jayal, which made an unsuccessful bid on Kamet in 1953, scaled Abi-Gamin on June 17. The peak was first scaled by an Anglo-Swiss expedition on August 22, 1950, the climbers being Dr. Gabriel Chevalley, Rene Dittert, Alfred Tissiers and K. Berril, with Dawa Thondup.

In 1955, another party headed by Maj. Jayal, which this time succeeded in climbing Kamet, scaled Abi-Gamin as well on the same day (July 6). Maj. Jayal had previously failed on Kamet in 1952 and 1953, first with a party conducted by Maj.-Gen. (now Lt.-Gen.) H.M. Williams, when Lt. P.P.S. Bhagat died of septicaemia, and second when he himself headed a nine-man team. The peak was first scaled by a British expedition on June 21, 1931, the climbers being Mr. Frank Smythe, Eric Shipton, R.L. Holdsworth, E. St. J. Birnie and C.R. Greene, with Lewa and Kesar Singh.

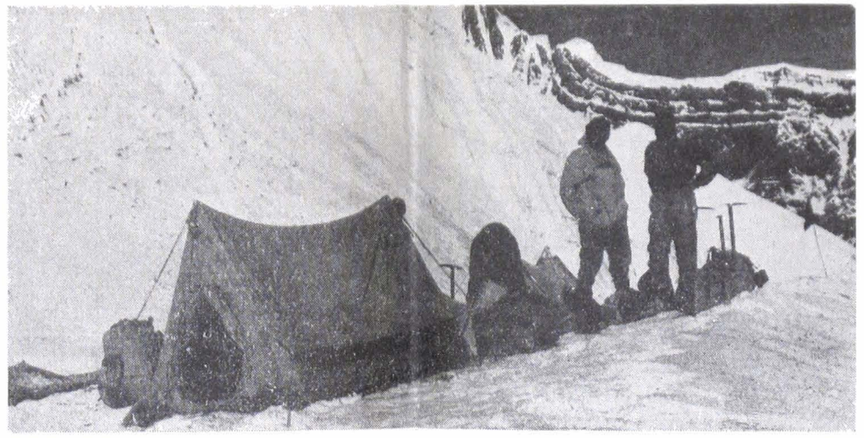
In 1956, Shri Keki Bunshah climbed Trisul, with Gyalzen Min-chung, on June 12. An attempt made the same month on Mrigthuni by a party organised by Shri Gurdial Singh had to be given up owing to the death from illness of a member, N. Chukkerbutty.



The 1961 Nanda Devi expedition setting up Camp I on Devistan I

CLIMBING IN GARHWAL-KUMAON HIMALAYA

The 1961 Nilakantha expedition at a camp on the Satopanth glacier



An expedition led by Maj. Jayal, which actually aimed at Saser-Kangri (25,170 ft.) in the Karakorams but failed in its attempt, climbed Sakang, near the Sakang-Lungpa glacier, on July 25.

An expedition to Nanda Devi led by Maj. Jayal in July 1957 had to be abandoned owing to foul weather when it was hardly 650 feet short of the summit. The peak was first climbed on August 29, 1936, by an Anglo-American expedition organised by Mr. H.W. Tilman, those getting to the top being the leader and N.E. Odell.

Six Climbs in 1958-59

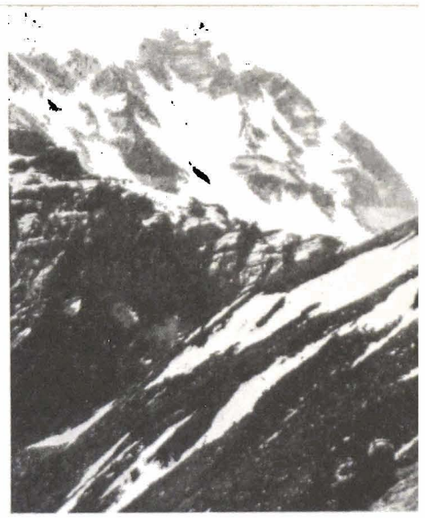
Three expeditions went out in 1958, one to Nepal and the other two to the Garhwal-Kumaon Himalaya. The first, headed by Shri Bunshah and sponsored by the I.M.F., climbed Cho-Oyu on May 15, Maj. Jayal, who was a member, dying of pulmonary congestion. The peak was first scaled on October 19, 1954, by an Austrian expedition led by Mr. Herbert Tichy, those reaching the top being the leader and S. Joechler, with Pasang Dawa Lama.

An Army-Navy team headed by Capt. Narinder Kumar ascended Trisul on June 4. Shri Gurdial Singh led a party to Mrigthuni that scaled the peak on June 19.

The year 1959 saw each of the three Defence Services mount an expedition to the Garhwal-Kumaon Himalaya.

A Naval party led by Inst.-Lt. M.S. Kohli climbed Nanda-Kot on May 25. The peak was first scaled on October 5, 1936, by a Japanese party under Mr. Y. Hotta, the five climbers including the leader, with Ang Tshering.

An Army (Artillery) team headed by Capt. Jagjit Singh.....better known as gunners.....scaled the Black



Nanda Devi as seen from above the Rishiganga gorge

A camp near Meade's Col on the east face of Kamet (1955)

Joshimath (6,000 ft.) in upper Garhwal

Deodars in the Dhauliganga valley

Crossing the Dhauliganga by a rope-bridge

Camp I being set up on Trisul (1951)

Mrigthuni as seen from a camp on Trisul

Maj. John Dias, Instructor-Lt. M.S. Kohli, Shri Gurdial Singh, Capt. Narinder Kumar, Shri Sonam Gyatso and Shri O.P. Sharma

Peak on June 7 and 8. The peak was first climbed in 1955 by Mr. Jack Gibson, who had led a team of students from the Mayo College and the Doon School, after an unsuccessful bid in 1953.

An Air Force team organised by Air Commodore (now Air Vice-Marshal) S.N. Goyal ascended Chaukhamba I on October 17. The peak was first scaled in 1952 by a French expedition, the climbers being L. George and V. Russenberger.

TENZING'S CLIMBING EXPLOITS

A trained climber of very long standing, Shri Tenzing Norgay planted the Indian, Nepalese, British and U.N. flags on Everest in 1953, when as a member of the successful British expedition led by Col. (now Brigadier) Sir John Hunt, he jointly shared with Sir Edmund Hillary the honour of being the first to reach the world's highest summit.

Originally hailing from the Solo-Khumbu district of Nepal, Shri Tenzing settled down in Darjeeling several years ago. After working as a high-altitude Sherpa, Shri Tenzing became a Sirdar, in which capacity he exercised full control and authority over seasoned Sherpas. Later, he was accepted as a full-fledged member of several foreign expeditions and travelled in almost every section of the Himalayas. In the course of his close association with Himalayan expeditions for more than 25 years, he has been to the Everest region alone as many as seven times.

The following is a brief record of Shri Tenzing's well-known climbing exploits :

1935—Accompanied Mr. Eric Shipton's reconnaissance party to Everest.

1936—Went with Mr. Hugh Ruttledge's expedition to Everest and reached the North Col.

1938—Accompanied Mr. H. W. Tilman's expedition to Everest and reached Camp VI (27,330 feet).

1939—Went with a party to Tirich-Mir in the Hindu-Kush range and reached 23,000 feet. Later, during the war years (1940-45), acted as adviser for training the Chitral Militia in mountain-craft in the Hindu-Kush range.

1946—Carried out explorations in the Kangchenjunga region.

1947—Accompanied a Swiss expedition to the Kumaon Himalaya and climbed four virgin peaks.

1949—Carried out explorations in Nepal with Mr. Tilman.

1950—Was with a Doon School party in the Kumaon Himalaya.

1951—Went with a French expedition to Nanda Devi and reached the east summit (25,000 feet).

1952—Accompanied two Swiss expeditions to Everest, the first led by Mr. Edouard Wyss-Dunant and the second by Dr. Gabriel Chevalley, reaching the heights of 28,210 and 26,560 feet respectively, without oxygen, with the famous guide, Mr. Raymond Lambert.

1953—Went with Col. Hunt's expedition to Everest and climbed the peak with Sir E. P. Hillary.

In 1954, Shri Tenzing visited Europe. In 1955-56, he was awarded the Guides Badge of the Swiss Alpine Club. In 1959, he went to Italy, when, apart from renewing contacts with mountaineering and ski-ing institutions in that country, he gained valuable experience in the latest ski-ing techniques.

Shri Tenzing was awarded the title of Padma Bhushan by the President in 1959 for his mountaineering achievements.

The first expedition to Everest, the world's highest peak, was sent by the Foundation in 1960 under the leadership of the Principal of the H.M.I., Brig. Gyan Singh, when three of its members, Capt. N. Kumar, Sonam Gyatso and Nawang Gombu, constituting the first summit party, were forced back by blinding blizzards after reaching 28,300 feet, barely 700 feet short of the peak—a point higher than the second highest peak in the world (K2).

With the terrors of its ice-falls and crevasses, the steepness and toughness of its slopes, the perpetual artillery of its avalanches, the dreaded wilderness of its South Col and, above all, the unpredictable weather over it, Everest has always posed a challenge to mountaineers.

The Gyan Singh expedition regarded its effort as a pilgrimage to a holy mountain. It, therefore, completely eschewed the use of the words "assault" and "conquest".

The year 1960 was, however, marked by one success, an expedition sponsored and financed by the 'Anand Bazar Patrika' and led by Shri Sukumar Roy, climbing Nanda-Ghunti by the northern route on October 22.

Most Successful Year

Encouraged by the Indians' performance on Everest, the I.M.F. undertook to sponsor three expeditions in 1961, one in Nepal and the other two in the Garhwal-Kumaon Himalaya. Two of these expeditions proved successful and the third, which failed to attain its main objective, however, climbed three other peaks as alternative targets. In addition, there were three

Dr. A.N. Nanavati

Shri C.P. Vohra, Capt. A.B. Jungalwala, Flight-Lt. A.K. Chowdhury, Shri K.P. Sharma, Shri Hari Dang and Shri Suman Dubey

other expeditions privately sponsored, two of which achieved success.

The hitherto unexplored and unclimbed peak of Annapurna III in Central Nepal was scaled by an expedition headed by Inst.-Lt. Kohli on May 6 in the midst of heavy snowfall and thunderstorm. With the ascent of Annapurna III by Indians, for the first time, all the four peaks in this Nepal Himalayan range have been climbed.

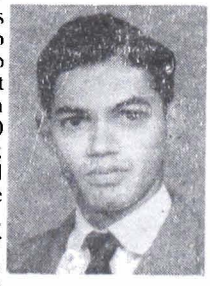
Similarly, the hitherto unclimbed peak of Nilkantha was scaled by an expedition led by Capt. Kumar on June 13.

The expedition to Nanda Devi led by Shri Gurdial Singh was abandoned on June 10, after Camp II had been established at a height of about 20,500 feet, owing to the early onset of monsoonish conditions. It, however, turned failure into success by climbing Devistan I on June 16, Maiktoli on June 21, and Trisul on June 30 within the space of a fortnight. Of these three peaks, Devistan I was climbed for the first time and Maiktoli for the second time, the latter having been first scaled by Mr. E.E. Shipton, with two Sherpas, in 1934.

Mana Attempt Fails

An expedition to Mana (23,860 ft.) led by Shri Biswadev Biswas and sponsored by the 'Anand Bazar Patrika' in August September was unlucky not to have been able to do the summit after attaining a height of 23,000 feet. This peak has been climbed only once before by Mr. F.S. Smythe as far back as 1937. A seven-man team led by Shri P. N. Chaudhuri of Delhi University climbed Nandaghat in the Garhwal-Kumaon Himalaya on October 20. Three members of a 15-man party headed by Shri Sonam Gyatso climbed Khangchengyau (22,700 ft). in Sikkim on October 21.

Maj. M.A. Soares



It will be against this perspective that the effort of the second Indian expedition to Everest, to be sent out by the I.M.F. in 1962 under the leadership of Maj. John Dias, will be watched with the keenest interest by mountain-lovers not only in this country but all over the world.

JAYAL'S PIONEERING SUCCESSES

In commemoration of the pioneering services rendered to mountaineering by the late Maj. N. D. Jayal, who died with the 1958 Indian expedition to Cho-Oyu, the Executive Council of the H.M.I. has instituted a Jayal Memorial Fund.

Mountaineers, who are always prepared to venture wherever the wild wind blows on craggy and rugged heights, have wholeheartedly welcomed the creation of this Fund which, administered by the Council, is utilised for stimulating the spirit of mountaineering among youth and for giving assistance to Indian expeditions.

The following is a record of the climbing achievements of Maj. Jayal:

1942—Accompanied Mr. R. L. Holdsworth and Mr. J.A.K. Martyn to the Arwa Valley glaciers above Badrinath and set up a camp at 19,000 feet.

1946—Joined Mr. Jack Gibson's party to Bandar-Punch and, with Mr. Tenzing Norgay, reached a height of 19,400 feet.

1949—Became an Instructor at the Army Ski School, Gulmarg, (now known as the Snow Warfare School) and stayed on there later to be appointed Chief Instructor and Commandant.

1951—Accompanied a French expedition to Nanda Devi as Liaison Officer and climbed up to 22,000 feet.

1952—Became Ski-ing Instructor at the Snow Warfare School. Accompanied a Bengal Sappers' expedition to Kamet.

1953—Led a Bengal Sappers' expedition to Kamet and climbed Abi-Gamin.

1954—Was chosen Principal of the H.M.I. and, before taking over, visited Switzerland at the invitation of the Swiss Foundation for Alpine Research in company with Shri Tenzing and a party of Sherpas, first to take part in a training course near the Aiguilles du Tour and then to do a rock-climbing course at Rosenlaui. Became the first non-Swiss to be awarded the Guide's Diploma and Badge, a rare distinction which the Swiss do not lightly bestow.

1955—Led a successful combined H.M.I. and Bengal Sappers' expedition and climbed Kamet. Was elected a member of the Alpine Club and went to England.

1956s-Ascended Sakang, near Saser-Kangri in the Karakorams.

1957—Led an H.M.I. advance course expedition to Nanda Devi.

1958—Was called upon to be a member of the climbing party of Mr. Keki Bunshah's Cho-Oyu expedition. Hurried through the low-lying valley of East Nepal by forced marches, and, after only a day's rest at the base camp, started off for Camp I on the glacier, and this cost him his life. Died of pneumonia at Camp I at 18,000 feet.

The Himalayan Peaks Climbed By Indians

The following are the details of climbs of Himalayan peaks by Indians since the setting up of the H.M.I.—

Names of Peak	*Location*	*Height in Feet*	*Date of Ascent*	*Expedition Leader*	*Names of Climbers*
ABI-GAMIN	India, Garhwal District (U.P.)	24,130	July 6, 1955	Maj. N. D. Jayal	Gurdial Singh and Capt. John Dias, with Porters Kalyan Singh, Diwan Singh and Bijay Singh
KAMET	India, Garhwal District (U.P.)	25,447	July 6, 1955	Maj. N. D. Jayal	The leader, with Sherpas Ang Tharkay, Da Namgyal, Ang Temba and Lakpa Dorje
SAKANG	India, in Karakoram range in Ladakh (J. & K. State)	24,150	July 25, 1956	Maj. N. D. Jayal	The leader, Vijay Raina, Dwarka Das and Ugam Pulzer, with Sherpas Da Namgyal, Nawang Gombu and Nawang Topgay
CHO-OYU	East Nepal	26,750	May 15, 1958	Shri K. F. Bunshah	Sonam Gyatso and Pasang Dawa Lama
TRISUL	India, Garhwal District (U.P.)	23,360	1. June 4, 1958	Capt. N. Kumar	Sub.-Lt. P. P. Mehta, with Sherpa Ang Nyima
			2. June 30, 1961	Shri Gurdial Singh	Capt. K. N. Thadani, with Sherpa Lhakpa and Porter Kalyan Singh
MRIGTHUNI	India, on Almora-Garhwal Boundary	22,490	June 19, 1958	Shri Gurdial Singh	The leader, Aamir Ali and Rajindar Vikram Singh, with Porters Kalyan Singh and Diwan Singh
NANDA-KOT	India, Almora District (U.P.)	22,510	May 25, 1959	Instr.-Lt. M. S. Kohli	The leader and K. P. Sharma
BLACK PEAK	India, Tehri-Garhwal District (U.P.)	20,956	June 7 and 8, 1959	Capt. Jagjit Singh	The leader, Capt. K. N. Thadani, Capt. M. S. Joshi, Capt. B. L. Bhatt, Lt. O.P. Manchanda, Lt. Y. K. Yadav and Dr. T. Ao, with Sherpas Phurba Lobsang and Dawa Thondup
CHAUKHAMBA I	India, Garhwal District (U.P.)	23,420	October 17, 1959	Air Commodore S. N. Goyal	Flight-Lt. A. K. Chowdhury, Flight-Lt. P. C. Chaturvedi, Sergeant C. P. Rawat and Pasang Dawa Lama
NANDA-GHUNTI	India, Garhwal District (U.P.)	20,700	October 22, 1960	Shri Sukumar Roy	The leader and Dilip Banerjee, with Sherpas Ang Tshering, Pemba Norbu, Ajeeba and Tashi
ANNAPURNA III*	Central Nepal	24,858	May 6, 1961	Instr.-Lt. M. S. Kohli	The leader and Sonam Gyatso, with Sherpa Sirdar Sonam Girmi
NILKANTHA*	India, Garhwal District (U.P.)	21,640	June 13, 1961	Capt. N. Kumar	O. P. Sharma, with Sherpas Phurba Lobsang and Lhakpa Giyalbu
DEVISTAN I*	India, Garhwal District (U.P.)	21,910	June 16, 1961	Shri Gurdial Singh	The leader, Maj. John Dias, Hari Dang, Suman Dubey and Lt. (Dr.) N. Sharma, with Sherpas Kalden and Nima and Porter Kalyan Singh
MAIKTOLI	India, Garhwal District (U.P.)	22,320	June 21, 1961	Shri Gurdial Singh	The leader, Maj. John Dias, Hari Dang and Suman Dubey, with Sherpas Lhakpa, Nima and Kalden and Porters Kalyan Singh and Bahadur Singh
NANDAGHAT	India, Almora District (U.P.)	21,690	October 20, 1961	Shri P.N. Chaudhuri	The leader, with Sherpa Pan Singh
KHANGCHEN-GYAU	Sikkim	22,700	October 21, 1961	Shri Sonam Gyatso	The leader and Jaswant Singh, with Sherpa Lhakpa Tenzing

*Climbed for the first time

INDIAN CLIMBING CLUBS & SOCIETIES

At its annual general meeting in 1959, the Himalayan Mountaineering Institute resolved that independent mountaineering clubs and societies should be set up all over the country to foster interest among youth in this open-air sport. These associations, it was stressed, should be self-sufficient units, though they could always look for technical guidance and expert advice to the Institute.

Likewise, the All-India Council of Sports, at a meeting in 1960, recommended priority being given to mountain-climbing as a sport and suggested to all the universities to form mountaineering clubs. It later accepted the recommendation of a committee appointed by it, with Gen. K. S. Thimayya as chairman, for the development of the H.M.I. as an important agency for furthering mountaineering and the pooling of equipment for undertaking expeditions sponsored by the Institute.

The following are some of the well-known organisations, having sprung up in India from time to time during the past 35 years, that have contributed to the advancement of mountain-climbing as an organised sport in the country:

Himalayan Club, Post Box No. 9049, Park Street P.O., Calcutta-16. *Founded*: 1927-28. *President*: Lt.-Gen. Sir Harold Williams, *Vice-Presidents*: Mr. T.H. Braham and Shri F.C. Badhwar, and *Secretary*: Mr. T.G. Cowie. *Aims and Objects:* (a) Encouraging and assisting Himalayan travel and exploration, and (b) Extending knowledge of the Himalayas and adjoining mountain ranges through science, art, literature and sport.

Himalayan Mountaineering Club, 21, Crosthwaite Road, Allahabad-3. *Founded:* 1950. *President:* Shri N. D. Agrawal, and *Secretary :* Shri S. P. Agrawal. *Aims and Objects :* (a) Exploring and climbing high ranges of the Himalayas, (b) Encouraging trekking and other open-air activities by organising expeditions from time to time, and (c) Arranging lectures on mountaineering by Indians and foreigners.

Mountaineering and Hiking Club, Bengal Engineer Centre, Roorkee. *Founded:* 1952. *President:* Col. K. C. Soni, *Vice-President:* Lt.-Col. P. V. Wright, and *Secretary:* Capt. D. V. Padsalgikar. *Aims and Objects:* (a) Promoting a spirit of adventure among all ranks of the Engineer Group, (b) Encouraging young officers to take part in mountaineering expeditions, and (c) Organizing hikes regularly.

Air Force Trekking Society, Air H.Q., New Delhi. *Founded:* 1952. *President:* Air Marshal A. M. Engineer, *Vice-President:* Air Vice-Marshal S. N. Goyal, *Secretary:* Wing Commander B. S. Agnihotri. *Aims and Objects:* (a) Encouraging young officers to spend part of their annual leave in the healthy pursuit of trekking to scenic spots in the Himalayas, and (b) Forming a source of information on routes in the Himalayas, and elsewhere for officers intending to do trekking in these regions.

Himalayan Heights Mountaineering Club, The University, Saugor. *Founded:* 1958. *President:* Dr. W. D. West, and *Secretary:* Shri B. D. Misra. *Aims and Objects:* (a) Fostering an appreciation of the Himalayas, the great national heritage, (b) Inculcating among members a spirit of adventure, and (c) Organising instructional courses in rock-climbing and snow-and-ice craft.

Army Mountaineering Association, General Staff Branch, Army H.Q., New Delhi. *Founded:* 1959. *President:* Maj.-Gen. D.C. Misra, M.C., and *Secretary:* Maj. M.L. Chibber. *Aims and Objects:* (a) Stimulating interest in mountaineering and trekking in the Army, (b) Organizing periodical expeditions to various peaks in the Himalayas and mountains in other countries, and (c) Providing liaison with the other mountaineering organisations in the country and abroad.

Mountaineering Committee, Scindia House, Ballard Estate, Bombay-1. *Founded :* 1959. *Chairman :* Shri Ashoka Madgavkar, and *Joint Secretaries :* Kumari Malati Jhaveri and Shri Jagdish Nanavati. *Aims and Objects :* (a) Organising mountaineering and rock-climbing courses in the Western Ghats, (b) Providing rock-climbing equipment, and (c) Holding periodical lectures and film shows on mountaineering activity.

Himalayan Association, 89, Mahatma Gandhi Road, Calcutta-7. *Founded :* 1960. *President :* Shri Probodh Kumar Sanyal, and *Secretary :* Shri Sukumar Roy. *Aims and Objects :* (a) Organising mountaineering expeditions by civilians, (b) Collecting and diffusing information about the Himalayas, (c) Exploring the less frequented Himalayan tracts, and (d) Making the people conscious of their Himalayan heritage in every possible way.

Naval Trekking Society, Naval H.Q., New Delhi. *Founded:* 1960. *President:* Rear-Admiral A.K. Chatterji; *Vice-President:* Capt. J. S. Mehra, and *Secretary:* Lt.-Commander V. Raman. *Aims and Objects :* (a) Developing among officers and sailors of the Navy a love for the hills, (b) Encouraging Naval personnel to trek, explore and climb, and (c) Promoting a sense of team-spirit and leadership.

University Mountaineering Club, Jabalpur. *Founded:* 1960. *President:* Brig. Budh Singh, and *Secretary:* Shri G. P. Tiwari. *Aims and Objects:* (a) Promoting a love for outdoor life and a spirit of adventure, (b) Organising mountaineering training for students and teachers, and (c) Cultivating among its members team-spirit, leadership and comradeship.

In addition, there are the Himachal Winter Sports Club at Kufri in the Simla Hills, the Kumaon Mountaineering Club, Naini Tal, the Young Mountaineering Club, Pilani, the University Mountaineering Clubs at Calcutta, Nagpur and Aligarh, and the Paribhraman, Ahmedabad. Several other mountaineering organisations are being formed in the States one by one, the latest being in Kerala.

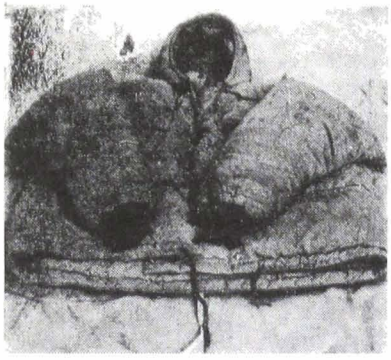
The Doon School, Dehra Dun, Lawrence School, Sanawar (Simla Hills), the Modern School, New Delhi, the Mayo College, Ajmer, and the National Academy of Administration, Mussoorie, are institutions that have evinced keen interest in this open-air sport.

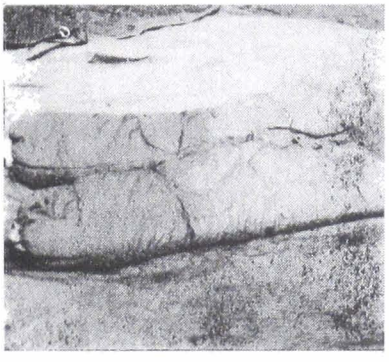
HEIGHTS OF PEAKS

The heights of peaks given in this brochure are those at present accepted as official by the Survey of India.

Most of these heights are, however, those fixed by the geodedic surveys during the last century from distances of 100 to 200 miles away from the peaks and are, accordingly, liable to some improvement in accuracy in the light of modern advances in techniques and observations likely to be made from closer range.

INDIGENOUS CLIMBING EQUIPMENT





"He that mounts the precipices wonders how he came thither, and doubts how he shall return.....His walk is an adventure and his departure an escape. He has a kind of turbulent pleasure, between fright and admiration."

— *Dr. Samuel Johnson*

MOST of the mountaineering equipment carried by Indian expeditions to the Himalayas during the past two or three years was indigenous, having been manufactured mainly in the Ordnance Factories. Only specialised equipment was imported from England, France and Switzerland.

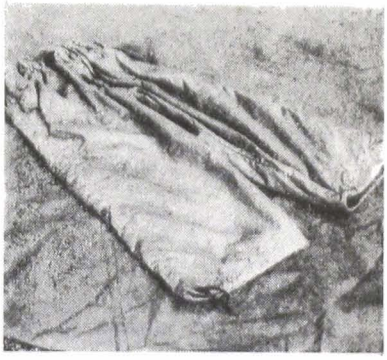
Items of indigenously manufactured stores and equipment were balaclavas, pullovers, eider-down jackets and trousers, windproof jackets and trousers, ruck-sacks, complete with straps and webbing, windproof gloves, silken and nylon down-mittens, canvas gaiters, down-camp boots, Astrakhan camp boots, camp shoes, double-sleeping bags, high-altitude Meade tents, 15-man tents, tent pegs and poles, bivouac sacks, kit bags, steel pitons (ice and rock), screw pitons (steel and dural), crampons, piton hammers and ice-axes, adjustable crampons, aluminium karabiners and wire-ladders.

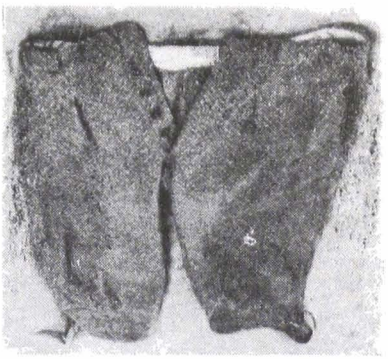
Successful Trials

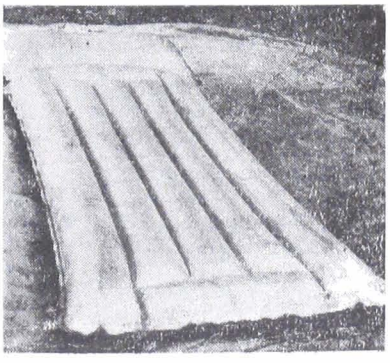
All these stores, which had been tested and found suitable to withstand conditions at high altitudes, have proved to be in no way inferior to the imported variety. Some of these were produced by private firms, like the Bata Shoe Company, which had made climbing, marching and hunter boots. These too had been selected for the expeditions only after successful trials held under the auspices of the Himalayan Mountaineering Institute.

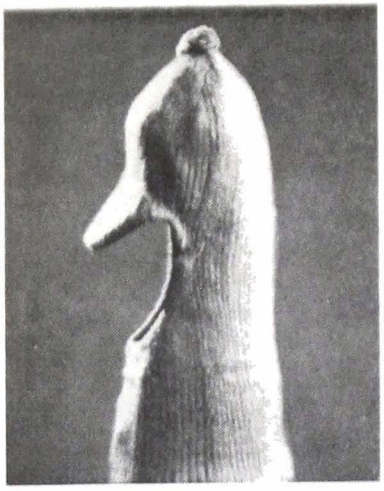
All the indigenous equipment, whose manufacture was undertaken by the Ordnance Factories and some Indian firms on specifications and samples provided to them, stood the test well. Though some improvements in them are certainly possible

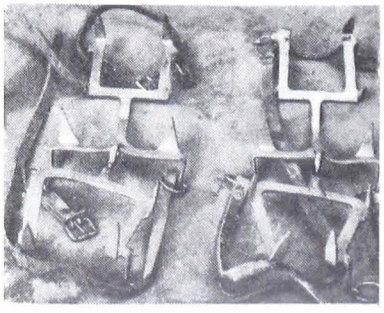
FROM TOP TO BOTTOM: Left—Pullover, Eider-down Jacket, Windproof Jacket and Eider-down Trousers; Right—Windproof Trousers, Climbing Trousers, Sleeping Bag and Air-Mattress.











by slight modifications, the expeditions were more than satisfied with their performance.

It is felt that future expeditions will not have to depend on imported equipment, except that for some time oxygen and certain other raw materials, like eider-down and wind-proof fabric, will continue to be imported.

The food industry in India is also producing tinned provisions for the use of expeditions at high altitudes. Items like egg-powder, fruit-juice powder, which are either not available at all or are not of the requisite standard, will, however, have to be imported.

Inquiries about the availability of climbing equipment can be made from the Himalayan Mountaineering Institute.

Everest Exhibition

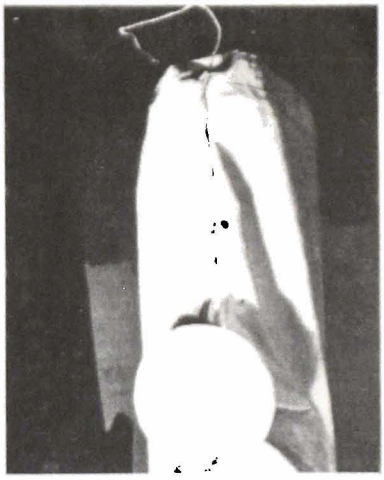
In order to arouse public interest in mountaineering, a week-long exhibition of the climbing equipment of indigenous manufacture used by the Indian expedition to Everest and the photographs taken by its members was arranged by the Directorate of Advertising and Visual Publicity of the Ministry of Information and Broadcasting, on behalf of the Sponsoring Committee, in the All-India Fine Arts and Crafts Society Hall in New Delhi in July 1960.

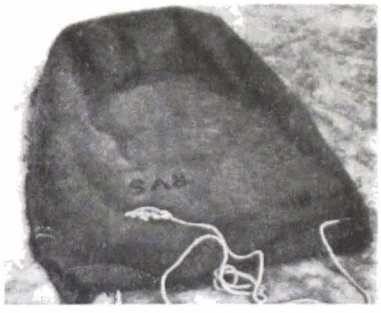
More than 150 pictures, some blown up to huge dimensions as photo-murals, recounted the entire story of the expedition. Technically, the pictures displayed at the exhibition were hailed by experts as some of the finest photographic records of the eternally snow-bound regions of the Himalayas.

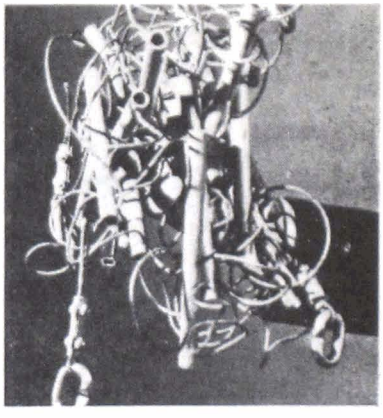
Opening the exhibition, the Prime Minister said that the expedition to Everest, "undertaken by a disciplined group in a spirit of adventure, was deliberately organised to pave the way for a larger number of people to take to mountain-climbing and not for a handful to get the kudos." The H.M.I., he said, was doing "exceedingly well" imparting training in all aspects of mountaineering.

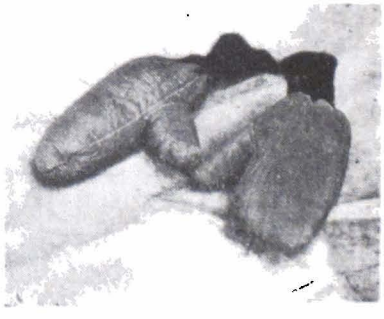
The exhibition was later arranged at Bombay, Poona, Calcutta, Roorkee, Ahmedabad and Bhavnagar.

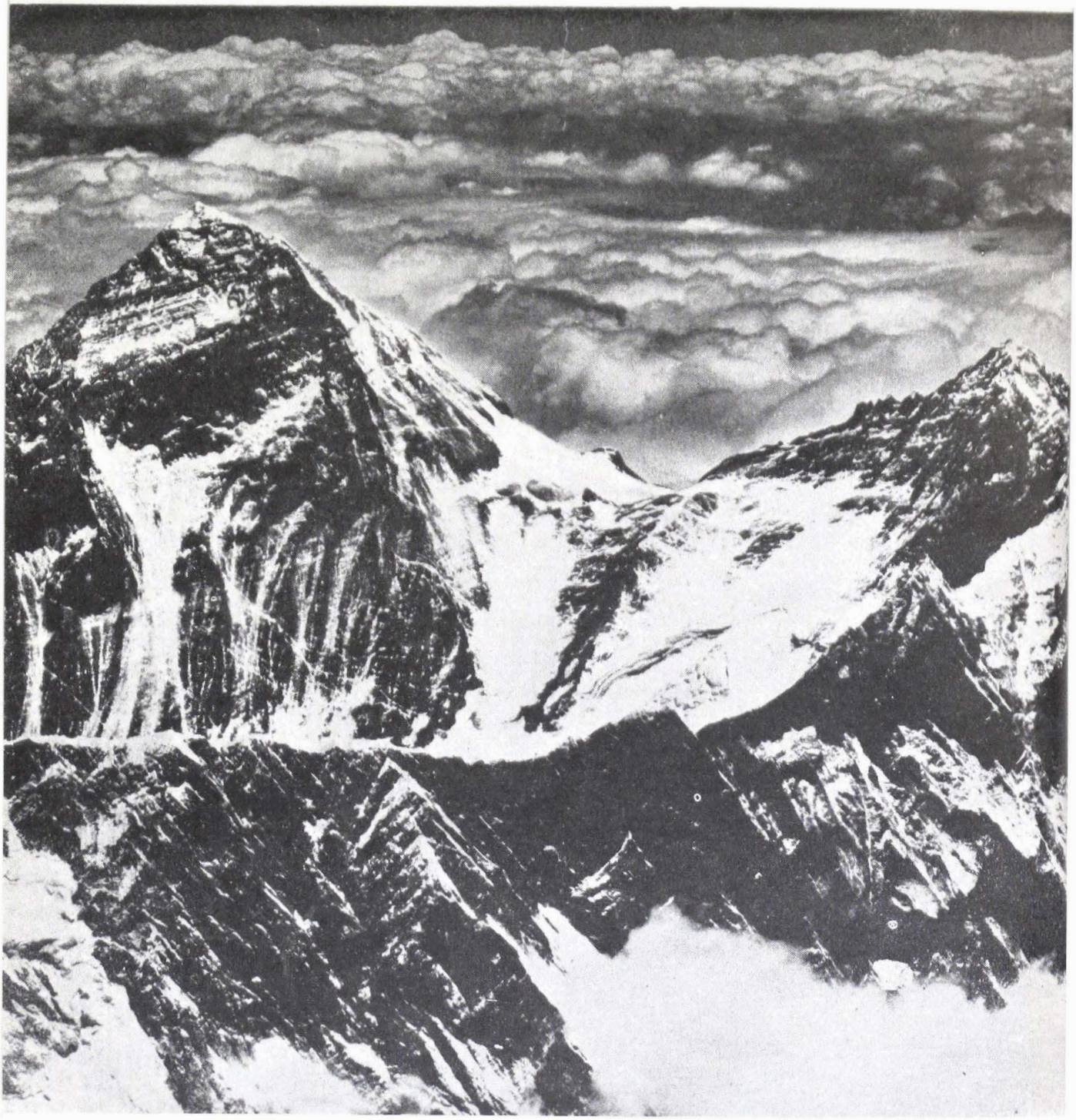
FROM TOP TO BOTTOM: Left—Cap Balaclava, Down-Camp Shoes, Climbing Boots and Crampons; Right Kitbag (General), Kitbag (Personal), Wire Ladder and Down-Mittens.











An aerial photograph of the Everest massif taken soon after the ascent of the world's highest peak by the Hunt expedition in 1953. *Courtesy* : Indian Air Force

AERIAL PHOTOGRAPHY OF EVEREST

"Mountain scenery is the antithesis not so much of the plains as of the commonplace. Its charm lies in its vigorous originality."

—Sir Leslie Stephen

IN 1933, the flight by two Westland aircraft over Everest was a creditable achievement worthy of the best traditions of human enterprise and adventure. Aviation was then still in its infancy, and the numerous problems that confronted the organizers required thorough scientific investigation and research.

The success of these flights, without doubt, achieved the main object of 'the desire to increase the human knowledge of Nature's greatest mountain stronghold'. The photographic record proved the efficacy of aerial surveys from great heights in remote and inaccessible regions.

The Indian Air Force, in planning a flight over Everest at the greatly advanced stage at which aviation was in 1953, set a comparatively easy task for itself. The four-engined piston-driven Liberator, fully fitted with the oxygen-supply system, was capable of exceeding the height of Everest by a safe margin, but required careful handling of the controls which have an inclination towards sluggishness in a rarified atmosphere.

1933 Houston Flights

The object, stimulated by the interest of the world focussed on the bid by Col. John Hunt's expedition on the summit in 1953, was very similar to that of the 1933 Houston flights—as they came to be known after the financial support given by Lady Houston. The original intention—that of synchronizing aerial photography of the Everest massif with the final attempt by the British expedition—was dropped in the interest of safety of the climbers.

On June 2, the news of the ascent of Everest on May 29 was announced. It was the signal for the aircraft appointed for the task, for which it had been carrying out intensive trials to ensure success, to stand by in readiness at the base of operations at the Gaya airfield in the plains of Bihar, 250 miles due south of the objective.

Liberator Takes Off

On June 6, eight days after the ascent, which, it was estimated, would allow time enough for the climbers to evacuate the region, the Liberator took off at 8 a.m. and headed northwards on a steady climb. The plains of Bihar, baked by the intense summer heat, were shrouded by a thick dust haze, and it was such a relief to climb above temperatures of 114° F into the cleaner and cooler upper atmosphere. But those on board soon began to be bothered by the cold, and, when the altimeter registered 15,000 feet, they received orders from the Captain, through the intercommunication, to put on their electrically-heated suits and don oxygen masks.

They were still over the plains, a hundred miles away, when suddenly gigantic white towers loomed into view through the limpid higher atmosphere. They could see the Kangchenjunga massif to the extreme right and Makalu slightly right of the Everest group straight ahead. The foot-hills were obscured by a layer of strato-cumulus clouds, and it was a disappointment to be denied a view of the approach to Everest through the lovely valleys of Nepal.

Having gained a height of 32,000 feet after an hour and a quarter, they were completely spell-bound at the sight of Everest, profoundly impressed by the awe-inspiring beauty and magnitude of her form. Not a wisp of cloud shielded the massif, and it appeared as if Everest stood posed for the photographer.

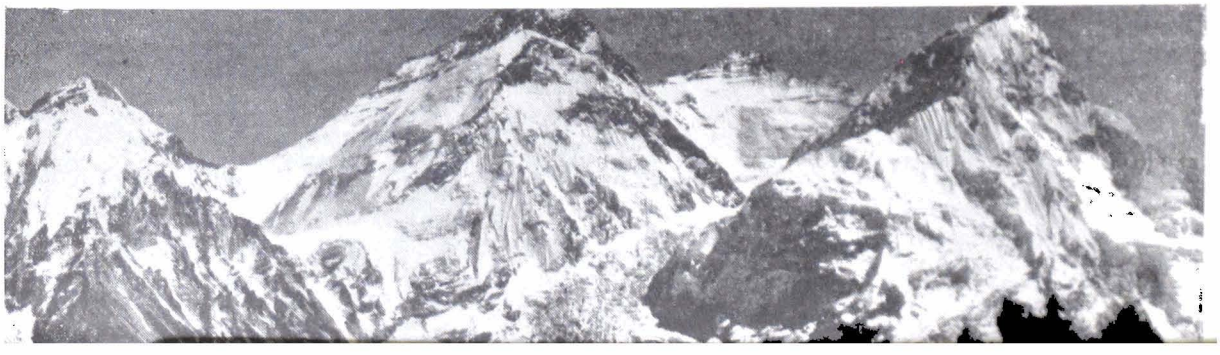
For over an hour, the Liberator circled south of the peak over Nepal and 'shot' the region with the aid of four cameras, every possible aspect and detail of the mountain being captured. Portholes were provided on the starboard side of the fuselage to enable proper aiming of the camera lens. The cold draught at 27° C that entered these ports added greatly to the difficulties of handling the cameras, which were provided with electrically-heated covers. Despite this precaution, there were stoppages which made a second sortie the following day necessary.

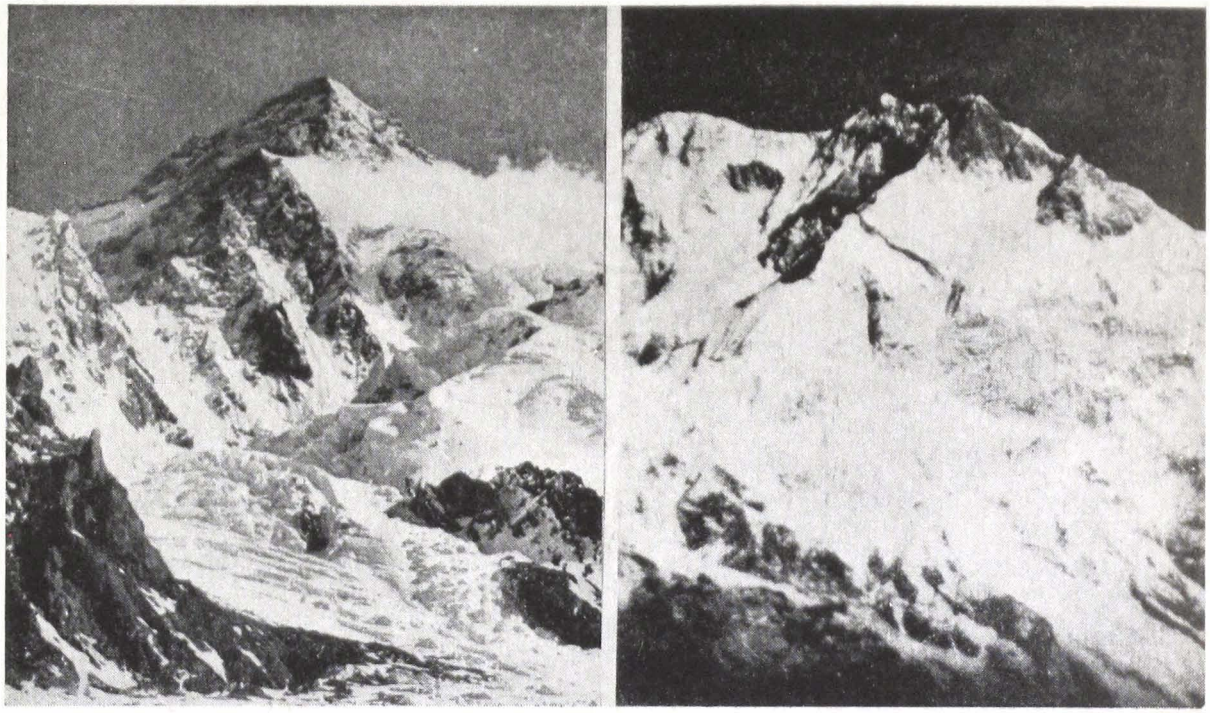
It was perhaps unusual luck to be blessed by two splendid days in succession, with Everest in supreme repose during a somewhat prolonged pre-monsoon lull. At no time did the aircraft experience any 'bumps', indicating the absence of turbulence, which very nearly brought to grief one of the Houston flight planes in 1933. In such favourable conditions, only good photographic results were to be expected.

Excellent Results

The cameramen were thrilled to observe their efforts yield excellent results. Their photographs greeted the victorious Everest expedition members when they returned to New Delhi. It was interesting to learn from them that they had a glimpse of the Liberator through the clouds from the Thyangboche monastery on their return journey.

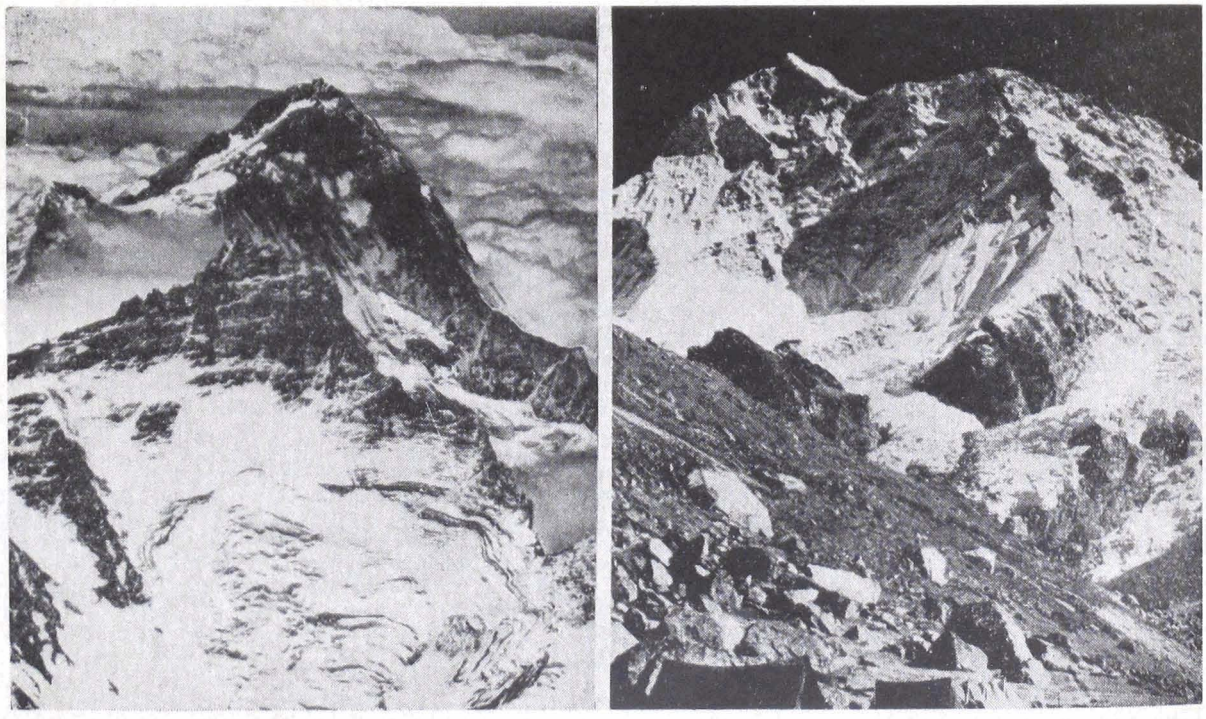
A view of the Everest group seen from Pumori (23,190 ft.) showing the entire route by which attempts have been made to scale the topmost peak in the world. Along the skyline (from left to right) are the North Peak, the North Col, Everest, the South Col, Lhotse and Nuptse. *Courtesy* **: 'Everest Expedition—1951'**





(Above)—Left ; K2 (28,250 ft.) and Right : Kangchenjunga I (28,208 ft.)

(Below)—Left ; Lhotse (27,923 ft.) and Right : Makalu I (27,824 ft.)



A view taken from Chogolisa I (25,110 ft.) —From left to right : K2 (28,250 ft.), Broad Peak I (26,400 ft.), Gasherbrum IV (26,000 ft.), Gasherbrum III (26,090 ft.), Gasherbrum II (26,360 ft.) and Gasherbrum I or Hidden Peak (26,470 ft.)

HIMALAYAS...THE ABODE OF SNOWS

"The Himalayas are not only near to us but also very dear for they have always been part of our history and tradition, our thinking and our poetry, our worship and our devotion; they are in our blood and are part of our make-up.....According to our mythology, they are the abode of the Gods."

—Jawaharlal Nehru

PROF. Kenneth Mason, in his book 'Abode of Snow', writes that in the beginning there were no mountains.

Before man came two great land-masses, separated by a shallowing sea, moved towards each other under the stress of elemental forces. The sediments of the sea were raised, first into gentle folds parallel to the land-mass edges and later into great mountain ranges. Molten mass welded into the primitive mountain arches, solidified and altered the adjacent rocks. Storm and rain carved the southern ranges into their present complex forms, while the highest, the Great Himalaya, shielded the highland of Tibet, where are found today, at over 20,000 feet above the sea, the fossilized remains of life in the ancient sea.

The Himalaya (a compound Sanskrit word meaning 'abode of snow') is the mountain region that feeds the perennial rivers of the Ganga—Yamuna, Ganga itself, Gogra, Gandaki and Kosi.

A Dominant Feature

The entire system of the Himalayas, stretching in a languid arc from the Indus in the west, for nearly 2,000 miles along India's northern boundary, to the Brahmaputra in the east and for 150 miles or so northwards from the plains of India to the highlands of Tibet, is the dominant physical feature of the earth. They are, and will always remain, a rich storehouse of material wealth, an endless source of inspiration to poets and artists, a standing challenge to intrepid explorers and climbers and a soothing balm for nerves frayed by the stresses and strains of present-day life.

Two Major Zones

There are two major mountain zones between the Ganga plains and Tibet universally recognised—Lesser and Great Himalayas. On the outer fringe of the Lesser Himalaya, facing the Indian plains, are the man-made hill-stations, at altitudes of 5,000 to 7,000 feet, of Murree, Dalhousie, Simla, Mussoorie, Ranikhet, Almora, Naini Tal and Darjeeling. The Great Himalaya is the axis of the whole system, and its crest rarely falls below 18,000 feet except at the great river gorges and at well-known passes.

Sovereign Dignity Of Everest

"Everest has been described as a dull, if imposing, mountain when seen from the north, and not to be compared with Makalu in grandeur and beauty. The latter is certainly a superb peak. Yet, grand mountain though it is, it somehow lacks the sovereign dignity of the world's highest summit."

—Frank S. Smythe

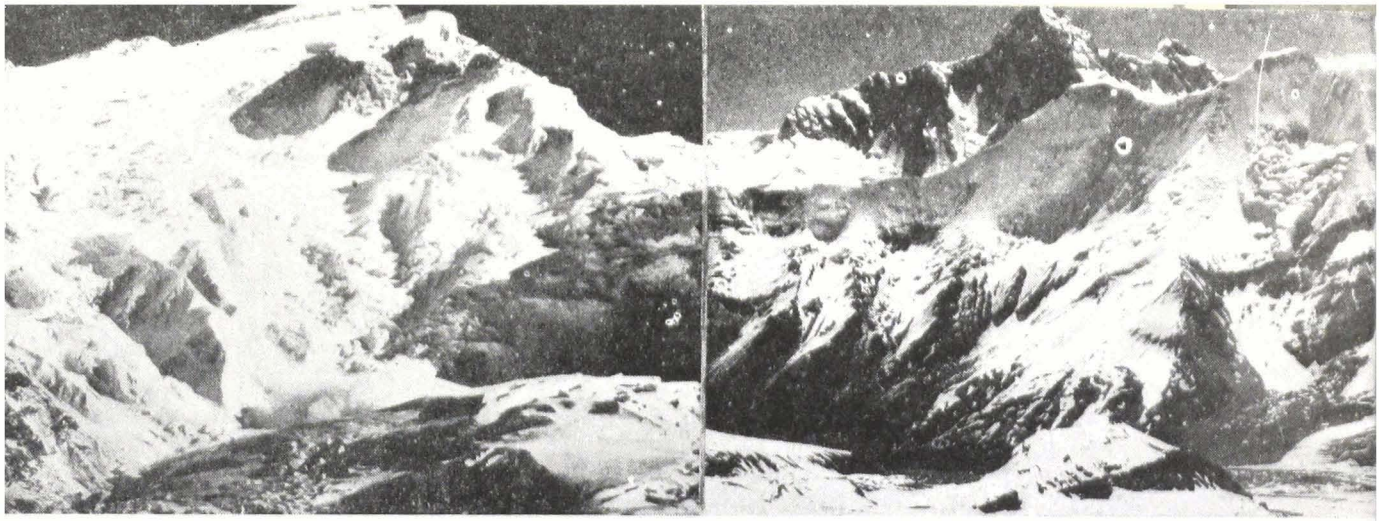
Within the axial zone of the Great Himalaya stand the highest massifs —Nanga Parbat I (26,660 ft.) in the west towering above the Indus, Nanda Devi (25,645 ft.) between the gorges of the Alaknanda and Goriganga, tributaries of the Ganga, in Uttar Pradesh, Dhaulagiri I (26,810 ft.) and Annapurna I (26,504 ft.), separated by the gorge of the Kali, a tributary of the Gandaki, in Nepal, Everest (29,028 ft.) and its neighbour Makalu I (27,824 ft.) along the Nepal-Tibet frontier, Kangchenjunga (28,208 ft.) on the Nepal-Sikkim border and Namcha Barwa (25,445 ft.) in the east towering above the Brahmaputra.

In the Great Himalaya there are about 30 peaks whose altitudes, all above 25,000 feet, are known with considerable accuracy, a dozen of them being above 26,000 feet. In order to reach them from India mountaineers must traverse the entire breadth of the Lesser Himalaya through winding valleys, across rivers and over passes.

Because of their great length, the Himalayas can be conveniently divided into six distinctive sections from west to east—Punjab Himalaya, Trans-Himalaya in Jammu and Kashmir State (principally the Karakoram and its associate ranges), Kumaon Himalaya, Nepal Himalaya, Sikkim Himalaya and Assam (or Bhutan) Himalaya.

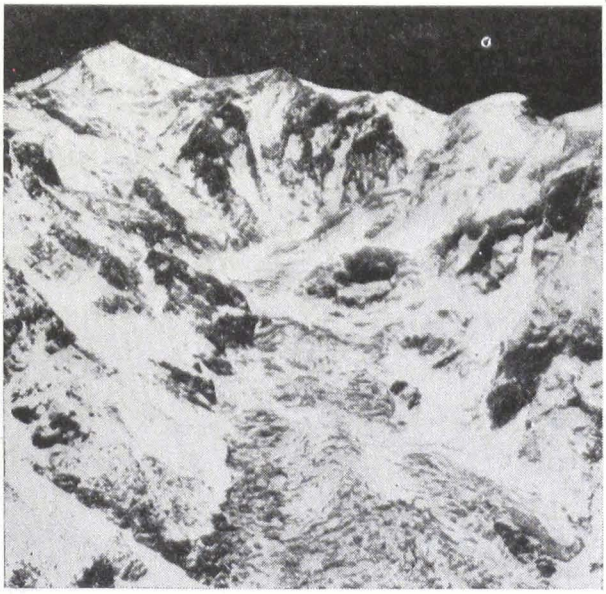
Punjab-Kashmir Region

The Punjab (or Kashmir) Himalaya, roughly a rectangular region, is 300 miles long by 150 miles wide, lying between the Indus on the northwest and the Sutlej on the south-



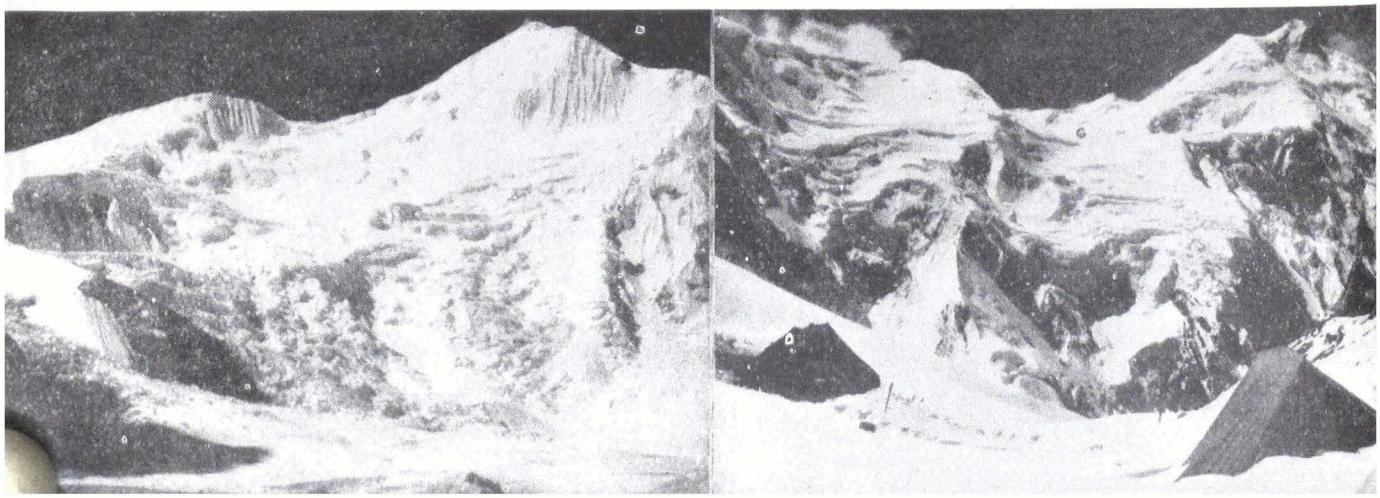
Left: Annapurna I (26,504 ft.), Right: Nanda Devi (25,645 ft.)

← Rakaposhi (25,550 ft.)



Gauri Shankar (23,440 ft.) →

Left : Chogolisa I (25,110 ft.), Right : Haramosh (24,270 ft).



east. It contains the mountain basins of four of the five great rivers of the Punjab—Jhelum, Chenab, Ravi and Beas—as well as the left-bank tributaries of the Indus and the right-bank feeders of the Sutlej. Its chief ranges are the Zaskar, the Pir Panjal and the Dhaula Dhar.

With the notable exceptions of Nanga Parbat I, one of the grandest mountains in the Himalayas, and the twin peaks of Nun (23,410 ft.) and Kun (23,250 ft.), the Punjab Himalaya carries no great peaks, except for Nanga Parbat II (25,620 ft.), Rakhiot Peak (23,210 ft.), Pinnacle Peak (22,810 ft.), Chongra (22,390 ft.), Leo Pargial (22,210 ft.), Ganalo (21,680 ft.), Deo Tibba (20,410 ft.), Kolahoi (17,799 ft.), Haramukh (16,872 ft.) and Koh-i-Nur (16,725 ft.).

Karakoram Range

The trans-Himalayan region of the Karakoram mountain range, north of the Indus, lies between the lower Shyok and the Indus on the south and the Shaksgam tributary of the Yarkand on the north. It is bounded by the Ishkoman and the Korumbar on the west and by the upper Shyok on the east. Between the lower Shyok and the upper Indus is the Ladakh range, and beyond the Korumbar on the west the mountains come to be known as the Hindu-Kush. Between the Shaksgam and the upper Yarkand on the north are the Aghil mountains.

The region, in which stands K2 (28,250 ft.), the second highest peak in the world, and 18 other peaks above 25,000 feet, is the most heavily glaciated outside sub-polar latitudes. The Great Karakoram, a term given to the main crest-zone of the whole system, which is divided into sections known as *mustaghs* (Turkish name for ice-mountains), namely Hispar, Batura and Baltoro Mustaghs, includes (besides K2) Gasherbrum I (26,470 ft.), Broad Peak I (26,400 ft.), Disteghil-Sar I (25,868 ft.), Kanjut-Sar I (25,460 ft.) and Saser-Kangri (25,170 ft.). The Lesser Karakoram, comprising ranges of shorter alignment, includes Masherbrum East and West (25,660 and 25,610 ft.), Rakaposhi (25,550 ft.), Saltoro-Kangri I (25,400 ft.), Chogolisa I (25,110 ft.) and Haramosh (24,270 ft.).

Tenzing, The Tiger Of The Snows

"It was William Blake, long ago, who wrote of his tiger, tiger, burning bright; but his imagined king of the forest burned no more brightly than does this latter-day flesh-and-blood tiger of the snows.

"There is a flame in Tenzing, a marvellously strong and pure flame that no storm of man or Nature can extinguish. It is compounded of dream and desire, will and struggle, pride and humility; and in the end, with the deed done, the victory gained, it is the man's humility that stands out above all his other qualities."

—James Ramsey Ullman

Garhwal-Kumaon

The Kumaon (including Garhwal) Himalaya is bounded by the Sutlej on the west and north and by the Kali (or Mahakali) on the east, which here forms the western boundary of Nepal. The left bank tributaries of the Sutlej, chief of which is the Baspa, and the right bank tributaries of the Kali—Dhauliganga, Goriganga and Ramganga—drain the two extremes of the region. Between them are the basins of the Yamuna, the feeders of the sacred Ganga—Bhagirathi, Mandakini, Alaknanda and Pindar—, and the Ramganga.

The well-known peaks in this region are Nanda Devi (25,645 ft.), Kamet (25,447 ft.), Abi-Gamin (24,130 ft.), Mana (23,860 ft.), Mukat Parbat (23,760 ft.), Chaukhamba I (23,420 ft.), Api (23,399 ft.), Trisul (23,360 ft.), Satopanth (23,213 ft.), Dunagiri (23,184 ft.), Kedarnath (22,770 ft.), Panch-Chuli (22,650 ft.), Sri Kailas (22,742 ft.), Mrigthuni (22,490 ft.), Maiktoli (22,320 ft.), Nampa (22,162 ft.), Hathi Parbat (22,070 ft.), Ghori Parbat (22,010 ft.) Devistan I (21,910 ft.), Gangotri I (21,890 ft.), Nilkantha (21,640 ft.), Mandir Parbat (21,520 ft.), Niligiri Parbat (21,240 ft.), Bandar-Punch (20,720 ft.), Nanda-Ghunti (20,700 ft.), Swargarohini (20,510 ft.), and Srikantha (20,120 ft.)

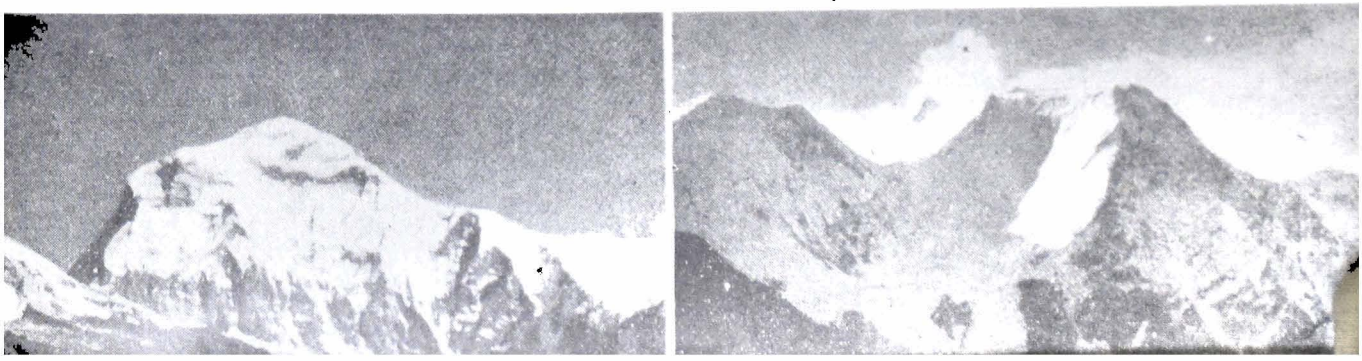
Nepal Himalaya

The Nepal Himalaya is drained by three large rivers, namely the Karnali in the west, the Gandaki in the centre and the Kosi in the east, with their several tributaries. It may be divided into three sections with relation to the rivers cutting through it—(i) from the massif of Api (23,399 ft.) on the west to Dhaulagiri I (26,810 ft.) inclusive, near the Kali (Gandaki) gorge, (ii) from this gorge to the Ganesh Himal (24,299 ft.), near the Trisuli (Gandaki) gorge, and (iii) from here to the Arun, exclusive of the great massif of Kangchenjunga, on the boundary with Sikkim.

In the two crest-zones there are three known summits over 27,000 feet, namely Everest (29,028 ft.), Lhotse (27,923 ft.) and Makalu I (27,824 ft.), six others more than 26,000 feet—Dhaulagiri I (26,810 ft.), Cho-Oyu (26,750 ft.), Manaslu I (26,760 ft.), Annapurna I (26,504 ft.), Gosainthan I (26,291 ft.) and Annapurna II (26,041 ft.)—and 14 more above 25,000 feet.

In the Karnali section in Western Nepal, the Seti river cuts back into

Left : Manaslu I (26,760 ft.) and Right : Dhaulagiri I (26,810 ft.)



The World's 20 Highest Peaks First Scaled

The following are the world's 20 highest peaks (all in the Himalayas above 25,000 feet), with details of first climbs. —

Name of Peak	*Location*	*Height in Feet*	*Date of Ascent*	*Expedition Leader*	*Names of Climbers*
EVEREST	Eastern Nepal, on Tibetan Frontier	29,028	May 29, 1953	Col. Sir John Hunt (British)	E.P. Hillary and Tenzing Norgay
K2	India, in Ladakh (J. & K. State) in Karakoram Range	28,250	July 31, 1954	Prof. Ardito Desio (Italian)	Achille Compagnoni and Lino Lacedelli
KANGCHENJUNGA I	Sikkim, on Nepal Border	28,208	May 25 & 26, 1955	Dr. Charles Evans (British)	George Band, Joe Brown, Norman Hardie and H.R. A. Streather
LHOTSE	Eastern Nepal, in Everest Region	27,923	May 18, 1956	Dr. Albert Eggler (Swiss)	Fritz Luchsinger and Ernst Reiss
MAKALU I	Eastern Nepal, in Everest Region	27,824	May 15, 16 and 17, 1955	M. Jean Franco (French)	The leader, Lionel Terray, Jean Couzy, Guido Magnone, Pierre Leroux, Jean Bouvier, Andre Vialatte and Serge Coupe
DHAULAGIRI I	Central Nepal	26,810	May 13 and 23, 1960	Dr. Max Eiselin (Swiss)	The leader, Norman G. Dyhrenfurth, Peter Diener, Ernst Ferrer, A. Schelber, Kurt Diemberger, Michael Voucher, H. Weber, Nema Darje and Nana
CHO-OYU	Eastern Nepal, in Everest Region	26,750	October 19, 1954	Dr. Herbert Tichy (Austrian)	The leader, S. Joechler and Pasang Dawa Lama
MANASLU I	Central Nepal	26,760	May 9 and 11, 1956	Mr. Yuko Maki (Japanese)	Toshio Imanishi, Kiichiro Kato, Minoru Higeta and Gyalzen Norbu
NANGA PARBAT I	India, in Kashmir (J. & K. State)	26,660	July 3, 1953	Dr. Karl M. Herrligkoffer (Austro-German)	Hermann Buhl
ANNAPURNA I	Central Nepal	26,504	June 3, 1950	M. Maurice Herzog (French)	The leader and Louis Lachenal
GASHERBRUM I	India, in Ladakh (J. & K. State) in Karakoram Range	26,470	July 4, 1958	Mr. Nicholas B. Clinch (American)	Peter K. Schoening and Andrew J. Kauffman
BROAD PEAK I	India, in Ladakh (J. & K. State) in Karakoram Range	26,400	June 9, 1957	Mr. Markus Schmuch (Austrian)	The leader, Hermann Buhl, Fritz Wintersteller and Kurt Diemberger
ANNAPURNA II	Central Nepal	26,041	May 17, 1960	Lt.-Col. J.O.M. Roberts (British-Indian-Nepalese)	R. G. Grant, C. G. Bonnington and Ang Nyima
GASHERBRUM IV	India, in Ladakh (J. & K. State) in Karakoram Range	26,000	August 19, 1958	Sig. Fosco Maraini (Italian)	Walter Bonnatti and Carlo Munro
DISTEGHIL-SAR I	India, in Kashmir (J. & K. State) in Karakoram Range	25,868	June 9, 1960	Mr. Wolfgan Stefan (Austrian)	Gunther Starker and Diether Marchart
NUPTSE	Eastern Nepal	25,725	May 16 and 17, 1961	Mr. Joseph Walmsley (British)	Dennis Davis, Chris Bonnington, Leslie Brown, Jim Swallow, Tashi and Ang Pemba
MASHERBRUM (East)	India, in Ladakh (J. & K. State) in Karakoram Range	25,660	July 6 and 8, 1960	Dr. George Bell (U.S.-Pakistani)	The leader, William Unsoeld, Nicholas Clinch and R. J. Akhtar
NANDA DEVI	India, in Garhwal (U.P.)	25,645	August 29, 1936	Mr. H. W. Tilman (British)	The leader and N. E. Odell
RAKAPOSHI	India, in Kashmir (J. and K. State) in Kailash Range	25,550	June 25, 1958	Capt. Mike Banks (British-Pakistani)	The leader and Tom Patey
KAMET	India in Garhwal	25,447	June 21, 1931	Mr. Frank Smythe	The leader, Eric Shipton, R. L. Holdsworth E. St. J. Birnie and C.R. Greene with Lewa and Kesar Singh

Nanga Parbat I (26,660 ft.)

the Great Himalaya between the Api-Nampa group and Saipal (23,070 ft.) but not completely through it. The trough between the two crests here is drained by the tributaries of the Karnali—Humla and Mugu. Gurla Mandhata (25,355 ft.) stands conspicuously on the northern crest 40 miles north of Saipal.

Gandaki & Kosi

The Gandaki section in Central Nepal is drained by the Gandak tributaries—Kali, Marsyandi, Buriganga and Trisuli. Between the Kali (or Krishna) and the Marsyandi are Annapurna Himal and the Lamjung Himal, between the Marsyandi and the Buriganga is the mountain block of the Larkya Himal, and between the Buriganga and the Trisuli is the group of peaks known as the Ganesh Himal. Of the mountains in the Annapurna Himal, the two highest are Annapurna I (26,504 ft.) and II (26,041 ft.), one at either end, the two others III (24,858 ft.) and IV (24,688 ft.) standing between them. The three chief summits of the Larkya Himal are Manaslu I (26,760 ft.), Manaslu II (25,705 ft.) and Himal Chuli (25,801 ft.).

The Kosi section in East Nepal is dominated by the Mahalangur Himal and Everest, with Lhotse (27,923 ft.) standing on its southern buttress, and Makalu I (27,824 ft.) to the south-east. It is drained southwards by the Kosi tributaries—Tamba, Dudh, Arun and Tamur, which are great obstacles to travel. Of the chief mountain groups in the area are the Langtang Himal and the Jugal Himal on the west between the Trisuli (Gandaki) and the Bhote (Kosi), including Langtang Lirung (23,771 ft.) and Dorje Lakpa I (23,240 ft.), with the massive Gosainthan I (26,291 ft.) on the north. On the east, Gauri Shankar (23,440 ft.) on the Rowaling Himal is the highest before the great group that forms the Mahalangur Himal, on which stand, from west to east, Cho-Oyu (26,750 ft.), Ngojumba Kang (25,720 ft.), Gyachung Kang (25,910 ft.), Everest, Lhotse and Makalu I.

Black Peak (20,956 ft.)

Sikkim & Bhutan

In the Sikkim Himalaya, the smallest of the six regions, Kangchenjunga I (28,208 ft.) is the highest mountain.

On the ridge running from west to east are Jannu (25,294 ft.), Kangbachan (25,782 ft.)—both located in Nepal—Kangchenjunga I, Kangchenjunga II (27,803 ft.). East of this there are two fine mountains, the Simvu massif—the highest point of which is 22,360 ft.—and the peerless Siniolchu (22,600 feet)—regarded by many as the most beautiful in the world. The ridge running north carries some fine peaks, including 'Nepal Peak' (23,560 ft.), 'Tent Peak' (24,089 ft.), and 'Jongsong Peak' (24,472 ft.). The ridge running south has Talung Peak (23,082 ft.) and Kabru (24,002 ft.). East of the group surrounding the Kangchenjunga is the peak of Pauhunri (23,385 ft.).

Very little is known of the Assam (or Bhutan) Himalaya, which carries the peaks of Chomolhari (23,997 ft.), Kula Kangri (24,784 ft.) and Namcha Barwa (25,445 ft.).

COMMON MOUNTAINEERING TERMS

THE following is a glossary of common words and terms used in mountaineering:

AIGUILLE (F) — A rock spire or ice needle. ALP (G)—A green pasture land on a mountainside. ANORAK—A wind-proof jacket with a hood attached. ARETE (F)—A spur; a narrow rib or lateral projection of a rock; a sharp ascending ridge of a mountain. AVALANCHE (F)—A large mass of snow, ice and rock sliding down a mountain slope; *Lawine* (G); *Valanga* (I).

BALACLAVA—A woollen cap which covers the head and cheeks right down to the neck. BELAY —Secure a rope by hitching it over a projection or winding it round the body; a firmly-planted ice-axe may be used for the purpose. BERG (G)—A mountain; *Fell* and *Field* (W). BERGSCHRUND (G)—A large fissure or crevasse separating the upper slopes of a glacier from the steeper slopes of ice or rock above; Rimaye (F). BIVOUAC (F)—A temporary encampment in the open without tents; *Gite* (F); *Schlafplatz* (G).

CAGOULE (F)—A long anorak descending below the knees. CAIRN—A small pile or heap of stones serving as a landmark on a mountain, generally on a pass, to indicate a route; *Carnedd* (W); *Homme de Pierres*(F); *Steinmann* (G). CHIMNEY—A narrow vertical cleft or gully in a rock or ice-wall through which a cliff may be climbed; *Cheminee* (F); *Kamin* (G). CHOCKSTONE— A large block of rock wedged in a chimney. CIMA (I) —A peak; *Cime* (F); *Horn* (G); *Pig* (N and W); *Pizzo* (I); *Spitze* (G); *Tind* (N). CLOGWYN (W)—A precipice. COL (F)—A pass or a saddle; a depression in a mountain-chain; *Beallach* (S); *Bwlch* (W); *Joch* (G); *Lucke* (G); *Sattel* (G). CORDEE (F)—A 'rope' or a party attached by a rope for safety. CORINICE—A projecting mass of hardened snow or ice overhanging the edge of a precipice; *Corniche* (F); *Gewachte* (G). COULOIR (F)—A steep gully or furrow of ice, snow or rock in a mountainside; *Canalone* (I); *Rinne* (G). COURTE-ECHELLE (F)—A "shoulder-up"; clambering on the body or head of another climber. CRAMPON (F)—A metal (iron or steel) frame with projecting spikes which can be fitted to the soles of climbing boots by straps to give a better hold on steep ice or hard snow; *Steigeisen* (G). CRETE (F)—A narrow crest or ridge; *Aas* (N); *Cresta* (I); *Crib* (W); *Druim* (S); *Grat* (G); *Kamm* (G). CREVASSE (F)—A deep crevice or fissure or crack in a glacier or snow-field, often of great depth, caused by its downward movement; *Crepaccio* (I); *Schrund* (G). CWM (W)—A steep-sided hollow; a large couldron or a lateral glen in a heavily-glaciated region; *Coire* (S); *Coomb* or *Combe* (F).

EIDERDOWN—Any warm and light material, like fur or soft feathers, used for quilting clothing. ENNUI—Mental weariness or boredom experienced at high-altitudes due to lack of occupation. ESPADRILLES (F)—Rope-soled climbing shoes; *Kletterschube* (G); *Scarpetti* (I).

GENDARME (F)—A rock-tower, usually on a ridge; *Guglia* (I); *Turm* (G). GLACIER—A "river" of ice formed by the accumulation or consolidation of snow; *Brae* (N); *Ghiaccio* (I); *Gletscher* (G). GLISSADE (F)—Slide down a steep snow or ice slope, either sitting or standing, using the axe to control speed and direction; a sliding descent on snow or ice; *Rutschen* (G).

HAVERSACK—A canvass bag with a shoulder-strap to carry up to 20 lbs. or so.

ICE-AXE—A mountaineer's axe mainly used for cutting steps on ice; *Pickel* (G); *Picozza* (I); *Piolet* (F). ICEFALL—A frozen waterfall of gigantic dimensions; cascading ice of a glacier even as a waterfall cascades the water of a river running down an uneven rocky course— the steepest section of a glacier, usually taking the form of a wildly jumbled mass of ice (a "jungle" of ice); *Eisfall* (G).

KARABINER (C)—A snap-link; a metal spring-loaded clip, usually used in conjunction with a piton, and a sling through which the rope may be passed for greater security during difficult ascents or descents; *Mousqueton* (F).

MARCHE (F)—Ice-step; *Stufe* (G). MASSIF (F)—A compact range or group of mountain heights. METAFUEL—A type of solid fuel available in the form of small white tablets which burns very economically in metal-stoves filled with wax which burns with a light-blue flame like methylated spirit. MITTEN—A kind of glove with thumb but no fingers—it is of three types, viz. eiderdown, woollen and wind-proof. MORAINE (F) —An accumulation of stones and debris carried down by a glacier to form ridges.

NEVE (F)—A high snow-field, usually the source of a glacier above the permanent snow-line; *Firn* (G). NYLON ROPE—A soft rope made of nylon material about 3/4 inch thick which has a breaking strength of 1,200 lbs.

PITCH—A difficult stretch of ice or rock between ledges. PITON (F)—A metal spike, with a ring in the head, which may be driven into rock or ice for fixing a rope to afford support for hands and feet, used in conjunction with a snap-link or karabiner to secure the rope passing between two climbers.

RAPPEL (F)—Descend down a very steep rock or ice-face with the help of a rope; the manoeuvre of letting oneself down a steep incline by means of a supplementary rope; *Abseil* (G).

SANGAR—A low wall serving as a windbreak. SCREE (F)—A slope of small loose stones or debris, usually found covering mountain slopes at the foot of steep rock-faces, that slide down when trodden; *Clappier* (F); *Geroll* (G); *Ur* (N). SERAC (F)—A tall pinnacle of ice, usually associated with icefalls and glaciers. SLALOM—A zigzag descent on skis. SLEEPING BAG—A type of quilt, very warm and light, filled with eiderdown or kapok material, fitted with a zip in the centre, joining the sides of the quilt. SNOW-BRIDGE —An arch or layer of snow joining two sides of a crevasse. SPUR—A rib of rock or lateral projection of a hill running down from a ridge; sometimes used for an arete.

THORL (G)—A narrow pass. TRAVERSE— Horizontal or diagonal crossing of a mountainside; crossing of a peak or pass from one side to the other.

VERGLAS (F)—Thin veneer or coating of ice on rock. VERTIGO—A self-simulated sensation of fear and dizziness at high altitudes.

(F in parenthesis indicates French derivation, G German, I Italian, S Scottish and W Welsh).

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DHAULAGIRI
ANNAPURNA
GOSAINTHAN
GAURI SHANKAR
CHO-OYU
MT.EVEREST
MAKALU
KANGCHENJUNGA
KHANGCHENGYAU
PAUHUNRI
CHOMOLHARI
KANGTO
KATHMANDU
GANGTOK
DARJEELING