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In This Issue

- WAR – A Pictorial
- The National Purpose
- Roads in the Himalayas

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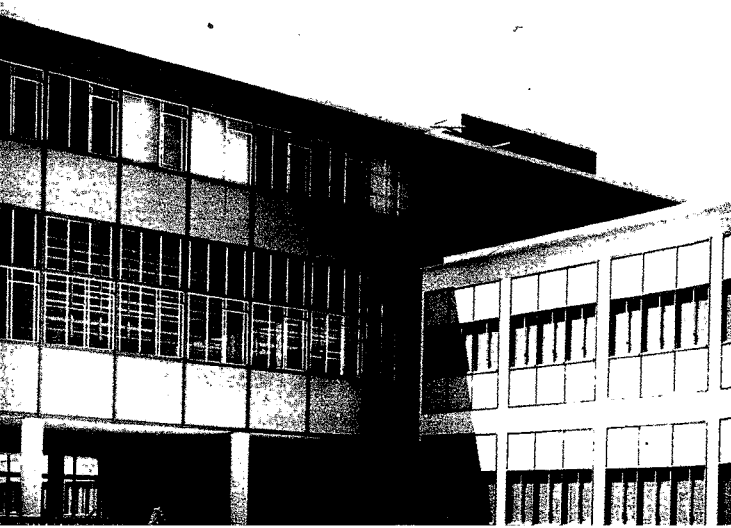

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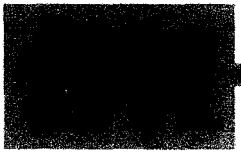

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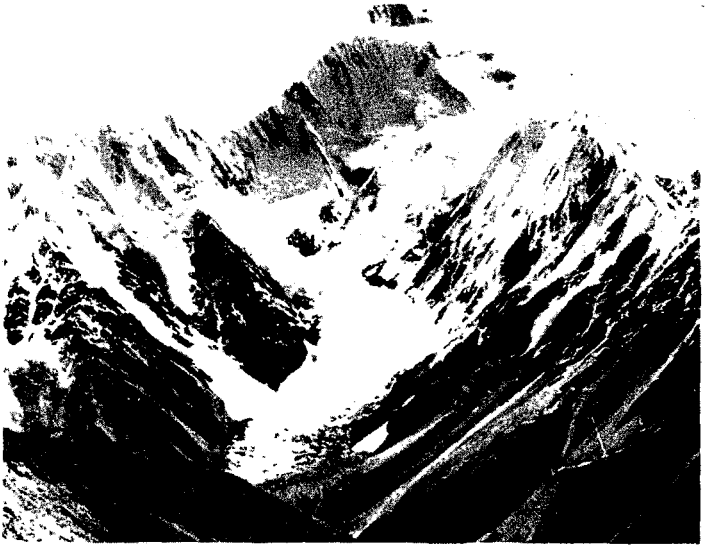
Land Communications



Through Asia's Highest Mountains

Wing Commander Maharaj K. Chopra, *Indian Air Force, Retired*

THE mountain complex which extends west to east from the Pamir knot to the trijunction of India, Tibet, and Burma forms the dividing barrier between central Asia and the Indo-Pakistan subcontinent.

For ages past, in textbooks as well as in common parlance, this mighty conglomeration of rock, snow, and forest has been called a "mountain wall," with its implication of impregnability. This is true in a way. The two regions, north and south of it, have kept distinctly apart from each other, giving rise to different kinds of civilizations and geopolitical inter-

ests which have almost never clashed.

In ancient times, hordes of migrants trekked westward, sometimes on to Europe, sometimes down to the Middle East and from the Middle East to India, but never southward directly into India. By the time they appeared in India the roundabout way, they were a different people, with many new physical and cultural features.

But while serving as a barrier, the mountain wall has neither been impregnable nor lacking in communications. Since ancient times, travelers have crossed it at numerous points from the north as well as the south, and under almost every limitation set by nature or man. Such cross movements have, of course, been few and confined to a small number of people, but some of them have been charged with enormous significance for mankind—it was along the trails and tracks of high Asia that Buddhism traveled to the east Asian lands.

Geographical Changes

Today, the mountain wall is crumbling before technology. To the north and south of it independent states have sprung up to confront one another along the highest crests. Mountains are being surveyed, rocks blasted, jungles cleared, and bridges laid. Here, in the land of the yak and the yeti, of glaciers and wildernesses, more and more sophistications of modern life are arriving in the trail of engineers, laborers, and soldiers. The aim of the whole endeavor is to open up the country, mostly by building roads. This will be a prolonged and gigantic operation. The mountain landscape is changing and, strategically, a new, curious world of power relations is being born.

For convenience as well as understanding of the lines of communications, the mountain complex may be divided into three sectors:

- The western, between the Pamirs and the western frontier of Nepal.
- The central, the state of Nepal.
- The eastern, between Nepal and the international trijunction.

This division does not conform strictly to geographical features—the western sector partakes of the central Asian as well as Himalayan landscapes. But it has some conformity with history and strategy.

Western Sector

The western sector includes all of Kashmir and parts of the states of Punjab and Uttar Pradesh. Facing them across the frontier are the territories of Sinkiang and Tibet. The physical features which affect communications are the high mountains, plateaus, rivers, and severe climate.

The Karakoram Range is the most prominent feature dividing India and China. From Hunza, a westernmost town, to Tibet it is 400 kilometers and contains the greatest cluster of the world's highest peaks, 33 above 7,300 meters. Mintaka, Kilki, and Karakoram are the three important passes in it connecting Sinkiang with Kashmir.

About 160 kilometers south of the western ramparts of Karakoram, and close to the northernmost bend of the Indus River, lies the famous peak of Nanga Parbat. Here, begins the Great Himalayan Range which extends to

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Wing Commander Maharaj K. Chopra, Indian Air Force, Retired, is military correspondent for the English-language Indian newspaper, The Indian Express. *A frequent contributor to the* MILITARY REVIEW, *he is the author of "Indian Ocean Strategy," which appeared in the May 1965 issue.*

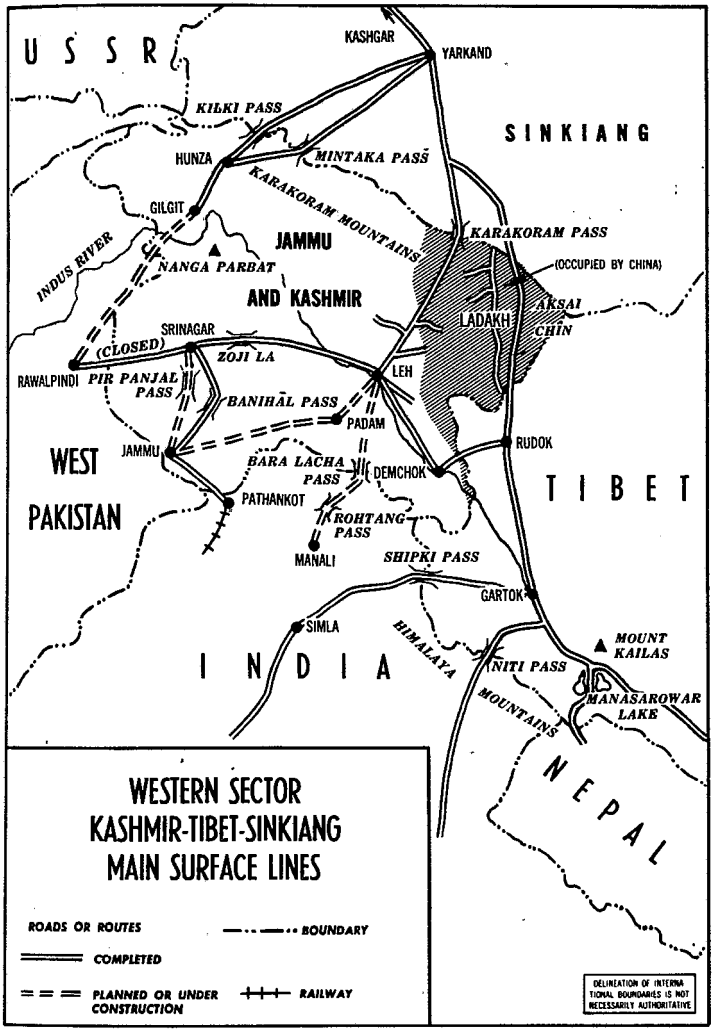
U S S R
KASHGAR
YARKAND
KILKI PASS
SINKIANG
HUNZA
MINTAKA PASS
KARAKORAM MOUNTAINS
GILGIT
KARAKORAM PASS
JAMMU
INDUS RIVER
NANGA PARBAT
(OCCUPIED BY CHINA)
AND KASHMIR
AKSAI CHIN
LADAKH
SRINAGAR
(CLOSED)
ZOJI LA
RAWALPINDI
PIR PANJAL PASS
LEH
BANIHAL PASS
PADAM
RUDOK
WEST
JAMMU
BARA LACHA PASS
DEMCHOK
T I B E T
PAKISTAN
PATHANKOT
ROHTANG PASS
MANALI
SHIPKI PASS
GARTOK
SIMLA
HIMALAYA MOUNTAINS
MOUNT KAILAS
I N D I A
NITI PASS
MANASAROWAR LAKE
N E P A L
WESTERN SECTOR
KASHMIR-TIBET-SINKIANG
MAIN SURFACE LINES
ROADS OR ROUTES
BOUNDARY
COMPLETED
PLANNED OR UNDER CONSTRUCTION
RAILWAY
DELINEATION OF INTERNATIONAL BOUNDARIES IS NOT NECESSARILY AUTHORITATIVE

Figure 1.

the Burma frontier, about 2,900 kilometers. That part which lies in the western sector goes only to the frontier of Nepal. Among its passes are the Burzil, Zoji, Bara Lacha, and Rohtang. Interspersed between the Karakoram and the Himalaya are smaller ranges. South of the Himalaya is another range, the Pir Panjal, which can be crossed through Banihāl Pass and Pir Panjal Pass. Between this range and the Himalayas is the valley of Kashmir about 135 kilometers by 40 kilometers.

Trans-Himalayan Region

The valley of Kashmir is 1,585 meters above sea level; the passes across the Pir Panjal Range are between 2,700 and 4,000 meters; while beyond the Himalaya toward the Karakoram there are few passes less than the summit of Mount Blanc, 4,600 meters. In other words, altitude rises as one travels north. And yet it is the trans-Himalayan region—Ladakh, for instance—which is comparatively more suitable for military operations.

The reason lies partly in the more level character of the surface north of the Himalayas, considerable portions of which are flat plateaus fit for roadbuilding and wheeled traffic. Here, too, rainfall is scanty—at places only 50 millimeters a year—and there is little erosion and drainage to obstruct movement. On the other hand, monsoons beat with all their fury on the Himalayas, giving rise to screaming rivulets, eroding the surfaces, creating gorges, and causing landslides. The Zoji La experiences a snowfall of 24 meters in winter. In the past, commanders have not been worried so much about the terrain between the Karakoram Range and the Himalayas as about the Himalayas themselves.

The communication system of the western sector falls broadly into two groups which have existed for centuries and still exist, although with modifications. One is between the Nepal and Punjab frontiers, the other through Kashmir.

In the first group two routes lead to Tibet. One takes off from close to Nepal and runs through the Niti Pass to Mount Kailas and Manasarowar Lake. In 1962, when China attacked, the route was closed. The second route, to the west, rises from the plains touching Simla and runs through Spiti leading to Tibet. Modifications have recently been made in this section.

Internationally, the communications through Kashmir are better known. They are based upon three principal towns in Kashmir: Srinagar, the capital; Leh in Ladakh Province; and Gilgit.

From the south one route crosses the Pir Panjal to Srinagar through Burzil Pass to Gilgit, and through Kilki or Mintaka Pass to Yarkand and Kashgar. Gilgit to Kashgar is 770 kilometers. Another route extends from Srinagar through Zoji La to Leh, and through Karakoram Pass to Yarkand and Kashgar. Leh to Kashgar is 930 kilometers.

Trade Channel

The Leh route is longer, but it provides a better channel of trade in numerous articles gathered from at least three civilizations: sugar, cloth, and pearls from India, jade from Tibet, and silk from China. A hundred years ago the Leh mart was one of the most cosmopolitan centers of Asia. With the advent of the Communist regime in mainland China both these routes were closed.

While there is a tradition that Alexander came to the Hunza Valley

and the historical fact that Genghis Khan came to the Indus after crossing the Karakoram, authorities agree that in the upper reaches of Kashmir no large-scale war has ever been fought in the past. The India-China battles fought here in the winter of 1962 were, therefore, the first of their kind, and have deeply affected the communication network of the area.

Important Network

This new network, completed or proposed, includes the Aksai Chin, one of the first roads the Chinese constructed in 1957 through the Indian territory of that name. Its location is important, because beyond it there is rocky desert through which roads cannot be constructed. The road runs for 160 kilometers through the Indian territory and is a part of the long highway which connects Sinkiang with Tibet. Another road, 130 kilometers long, has been laid westward parallel to it with feeder lines radiating to forward posts. These roads can take heavy trucks.

Indian roadways take off from the plains to the mountains with Jammu as the starting point. Jammu is situated at the foot of the Himalaya and is connected by road, which is being supplemented by a railway, to a railhead in the plains.

From Jammu to Srinagar a 320-kilometer road threads its way up the Pir Panjal and through the tunnel at Banihāl Pass. This all-weather road can be traversed by heavy vehicles, but is subject to landslides. From Srinagar to Leh, the road is usable only for six months a year.

Another road from Jammu to Srinagar has now been undertaken which will run through, or close to, Pir Panjal Pass west of the Banihāl route and would be about 280 kilometers long. This would also need a tunnel through the range.

A direct route from Jammu to Leh is contemplated, along Kishtwar, over the Bara Lacha Range and through Padam. Yet another direct route to Leh is planned, but it would not be from Jammu. It would start from Manali, a hill town 240 kilometers east of Jammu, snake up the Rohtang and Bara Lacha Passes, and cross the Indus before touching Leh.

The Hindustan-Tibet Road, completed last June, is the latest to be

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Roadbuilding in the mountains is a grueling, time-consuming, expensive task

constructed. About half of this 400-kilometer road, up to Simla, has been there for a long time, but the other half, from Simla to Tibet, took 14 years to build. The road, snowbound for part of the year, is aligned to the traditional mule track which runs along the Sutlej River and then di-

verts to the Shipki Pass on the Tibetan border.

A road from Rawalpindi through the Indus Valley to Gilgit will soon be completed. There is a proposal between Pakistan and China to open up the route from Gilgit to Kashgar, but its progress is uncertain.

Central Sector

The central sector of the mountain mass embraces Nepal, a little less than half of which is mountainous, and much of which is permanently under snow. Its east-west borders with India and Tibet are each 885 kilometers long and the intervening breadth is from 160 to 240 kilometers.

Except for a few salients, the entire Nepal-Tibetan border lies along the crest of the Great Himalaya. In it are located some of the world's highest peaks, including Mount Everest. Nevertheless, it has two dozen well-known passes fit for trade.

The 625-square-kilometer Katmandu Valley is the heart of the mountain kingdom and all communications must pass through it. Owing to the mountainous character of the north, these lines have been orientated toward the south and pass through the Terai, which is notorious for its malarial character, thick savanna forests, and big game. The Terai has long been a barrier between Nepal and India, but is now being opened.

For a considerable time, Nepal was content with the barest of communications in which porters, buffalo carts, ponies, donkeys, sheep, goats, yaks, elephants, an odd automobile, or a tiny steam engine took a hand. The main connection began at the Indian railhead of Raxaul from which a narrow gauge railway ascended 48 kilometers to Amlekganj in Nepal. Another 53 kilometers to Bijulpura ended the railway system. There was also an 80-kilometer road from Raxaul to Bhimphedi followed by a track on which motor vehicles were bodily carried to the last motorable 15 kilometers to Katmandu.

For 36 years the railway system has remained unaltered, but roadways have been improved and extended. The Tribhuvan Rajpath, six meters wide and 127 kilometers long, runs uninterrupted from the Indian border to Katmandu. Built by India, it has obvious strategic value. The Nepalese Government has embarked on a network of 1,600 kilometers of roads with the assistance of India, the United States, and the Soviet Union. In this will be included a lateral highway running along the entire east-west length which will probably form a part of the Asian highway.

In 1963 China also entered the field of roadbuilding in Nepal by electing to establish connections between the Tibetan border and Katmandu. The road which is presently under construction runs from Katmandu through Benapa to Kodari, an all-weather pass on the Tibetan frontier at an elevation of only 2,130 meters. The road, will be 130 kilometers long and is scheduled to be completed in 1966. A 20-kilometer motor road connecting Kodari to the main road leading to Lhasa, 965 kilometers away, was constructed by the Chinese before the Katmandu-Kodari link was undertaken. Thus, in a year's time one should be able to travel from the Indian to the Tibetan border by automobile in a matter of eight hours.

Eastern Sector

The eastern sector runs along the Tibetan frontier from Nepal to the trijunction of India, Tibet, and Burma, and includes Sikkim, Bhutan,

and the North-East Frontier Agency (NEFA). NEFA is divided from Tibet by the McMahon Line, which the Chinese have sought not to recognize in their bid to make territorial claims. It was the crossing of this line by the Chinese in 1962 that signaled the Sino-Indian border war.

The framework of this region is provided by the Brahmaputra River (Tsangpo in Tibet) which flows west-east in Tibet, takes a hairpin bend near the end of the McMahon Line,

Between Sikkim and the trijunction there is a string of high mountains. Although the eastern sector is about the least known part of the Himalayan Range, it can be crossed at numerous points. In general, passage is possible through valleys of rivers which flow south from the mountain sources to the Indian plains—the Tista in Sikkim, the Ama and Lhobrak in Bhutan, and the Subansiri, the Siang, and the Lohit in NEFA.

The passage from India to Tibet

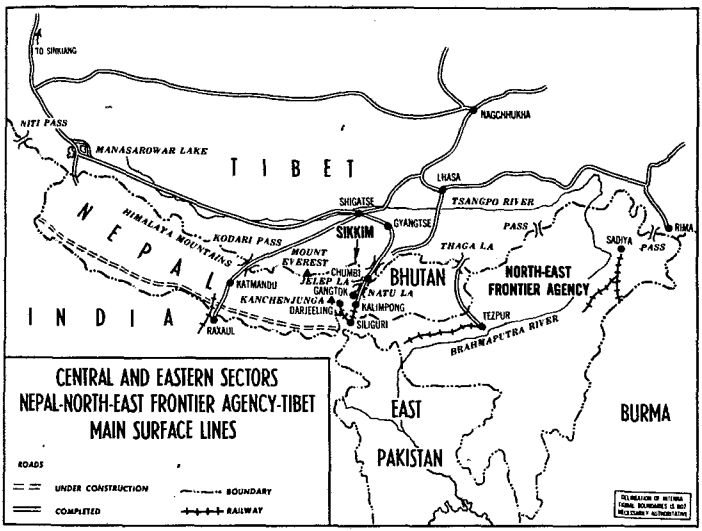

Figure 2.

flows east-west in India, and then near Bhutan runs south into the Bay of Bengal. At no point is the river more than 240 kilometers from the Himalayan crest. In India it almost skirts the Himalayan foothills, thus setting the pattern for communications between the plains and the mountains.

through the Chumbi Valley has been known and in use since ancient times. About 13 kilometers from the hills lies the Indian town of Siliguri where the meter gauge railway from the plains ends. Two 2-foot railway lines climb the mountains, one going to Darjeeling and another to Kalimpong,

the takeoff point for all travelers to Tibet. From Kalimpong the route goes through Jelep La on the Sikkim-Tibet border and Tang La at the head of the Chumbi River in Tibet to Gyangtse and Lhasa. The first British expedition to Lhasa in 1904 followed this route and improved its grading. This was also the route adopted by numerous expeditions to Mount Everest before the Second World War.

Feeder Roads

Many feeder roads have been constructed in Sikkim and Tibet. A ropeway, 21 kilometers in length, now operates in Sikkim carrying goods from Gangtok to Natu La. Roads are also under construction in Bhutan; some 1,280 kilometers have been planned and half have been completed, including a 172-kilometer road from the Indian border to the Bhutanese capital.

The NEFA has been the most backward of Indian territories. Before the Chinese struck in 1962, the stress was on opening up the country as quickly as possible by means of communication lines which could be economically constructed. As a result, approximately 6,430 kilometers of bridle paths were laid. Only one strategic motorable road was built. It extended from the foothills to halfway up the mountain over a distance of 130 kilometers. The remaining 110 kilometers up to the crest had no road.

The Chinese struck from three points: from near Bhutan, through Thaga La and Bum La; from the middle of the McMahon Line; and from the easternmost extremity. Only the first of these three prongs went down the entire Himalayan slope, and a part of it was along the Indian road.

In Indian hands now, this road has been extended and other strategic roads have been added. But the problem does not rest with the logistics of NEFA only; the communications of its immediate hinterland must also improve. The Brahmaputra is the backbone of this hinterland; its width, never less than 1.2 kilometers, becomes six or eight kilometers during the monsoons. The area south of the river is served by railroads of two different gauges requiring unloading and reloading at various points. The north is only scantily served. Connections between the northern and southern lateral railways have, until recently, depended upon ferry across the river. There is now one bridge and others are planned.

Chinese Roads

There is considerable secrecy over Chinese efforts to build communications on the flanks and the foreground of the mountains overlooking Tibet and Sinkiang, but there is no doubt that the efforts are of a massive character. The aim is to link China closely with Tibet, to open up the regions, and to strengthen frontiers all along the concave arc from the Pamirs to the Pacific.

This is a colossal task. The average height of Tibet is 3,650 meters, and between China and Tibet there are at least 29 passes which are frozen hard during winter. Supplies, as well as the Tibetan guerrillas, are a problem. Still, China puts high stakes on her communication lines in the area, and maintains that the Peking-Lhasa railway will be completed next year.

The two main border roads of China which have already been mentioned, the Aksai Chin through Kashmir and the Lhasa-Katmandu Road, are actually comparatively short sections of a vast communication project. The principal element is the road between

Rima, an easternmost town of Tibet, and Kashgar in Sinkiang, a distance of over 3,200 kilometers. This road runs almost parallel to the McMahon Line and the India-Nepal border, skirting the mountain foothills and following the Tsangpo Valley most of the way. It touches Manasarowar Lake and goes on to the frontier of Kashmir.

The Tsangpo has to be bridged at numerous points, a task probably not yet completed. But considerable portions of the road are reported ready for heavy traffic, and, with improvisations, movements between Kashgar and Rima could be uninterrupted.

Communication Hub

In the communication system which is now emerging, Lhasa appears to be the hub, having, in fact, become a crossroad between central China and Sinkiang. Its traditional link with the Chumbi Valley through Shigatse and Gyangtse has been improved, and to this has been added another link eastward which skirts the border of Bhutan. West of the Lhasa-Katmandu Road there are more roads facing the Hindustan-Tibet Road of India.

The layout of the roads north and south of the mountain complex is one of the many indications of the India-China confrontation. Two points of strategic significance may be noted. China has complete control of the entire territory north of the mountains. Her communications along the border are under one political authority, which not only ensures full coordination of the various elements involved, but also prescribes and implements one, undivided strategy. Political conditions on the Indian side do not permit this.

Between India's eastern and western territories there is no continuous land link to match the Rima-Kashgar link. Some such link may be formed once the Asian highway comes into being, from Vietnam through Cambodia, Thailand, Burma, India, Pakistan, Nepal, Afghanistan, and Iran to Turkey. But only part of it would pass through the Himalayan Range, and that through its lower regions. It would be a cultural, rather than a strategic link.

Another point relates to the Indian and Chinese hinterlands to the mountain complex. The Indian hinterland is a vast plain, 1,450 kilometers east-west, thickly populated, and highly developed. The Chinese hinterland consists of highlands and deserts which form a kind of barrier by themselves and serve as a buffer to the heart of China. From the mountain wall, a vital part of India is highly vulnerable and the vital part of China is highly secure. Thus, Indian communications in the mountains have a defensive character, while the Chinese lines implement a forward aggressive policy.

Roadbuilding Difficulties

To construct roads in the mountains is a grueling, time-consuming, and expensive task. The mountain complex has an area of 1.3 million square kilometers, largely unsurveyed. Some parts, important strategically, are all but inaccessible. Rivers and streams abound, are difficult to ford, and cause strange miscalculations by their unpredictable ebb and flow with seasons. Most areas are uninhabited and depend upon the plains for labor, provisions, and building material.

The shortage of labor in this part of the world is chronic and a main cause of delays. A casualty among the gang, by slip or landslide, is an occasion for mourning and for desertion.

India has now evolved a border road-building organization of a semimilitary character which has improved discipline but has not alleviated labor scarcity.

Roadbuilding in high mountains is a matter of high finance, for the cost per kilometer may range from $50,000 to $200,000. In view of the large sums involved, foresight and planning of a high order are required. In the case of India, the entire project has to be fully integrated into the national five-year plans. Search for economy as well as efficiency has led engineers to ask for better, more modern tools. Eventually, it may be that technique will be as important in these matters as human will, funds, labor, and material.

It is now recognized that however big the effort, roads alone cannot provide all the answers to the logistics of the region. India will soon be completing nearly 12,875 kilometers, but will be touching only the fringe of the problem. Areas will remain which can never be reached by roads.

Air communications in the mountains are indispensable. A large number of airstrips have been constructed on both the Indian and Chinese sides. In winter and during the monsoons, air communications are often the only means of contact between the forward posts and the base. In the event of a large-scale air war between India and China, the mountain area might be of marginal importance. However, at present, the stress is on capturing and holding land, and on the Chinese side, to be as close as possible to the line of guerrilla operations. It appears that presently, as, perhaps, in the long run, landlines are more important than airlines.

Different people would no doubt react differently to the herculean roadbuilding operations in the high mountains. The Indian hermits who have always been in search of Himalayan sanctuaries; the Chinese pilgrims who once came to India along impossible routes, suffering terribly; the Christians who carried the cross over the Himalaya into Tibet, half dead—men such as these would have welcomed them. The explorers, anthropologists, botanists, mountaineers, and especially the traders who have always sought, but never found, the short and safe routes between India and Tibet also would have welcomed the roadbuilding operations as would the many million mountain peoples who have remained backward for lack of communications with the outside world.

But these operations are not taking place against a religious, scientific, or humanitarian background. They are taking place against the background of border wars, frontier violations and ceaseless tension, declarations of bellicose intent and deployment of massive forces by China, and the flight of frontiersmen from their homelands.

It seems, indeed, that two different races and civilizations, so far kept distinctly apart by the mountain barrier, are moving closer to each other step by step in serious confrontation. Whether, ultimately, this is for the better or for the worse only the future can tell. In either situation, however, the mountain roadways will play a vital role.