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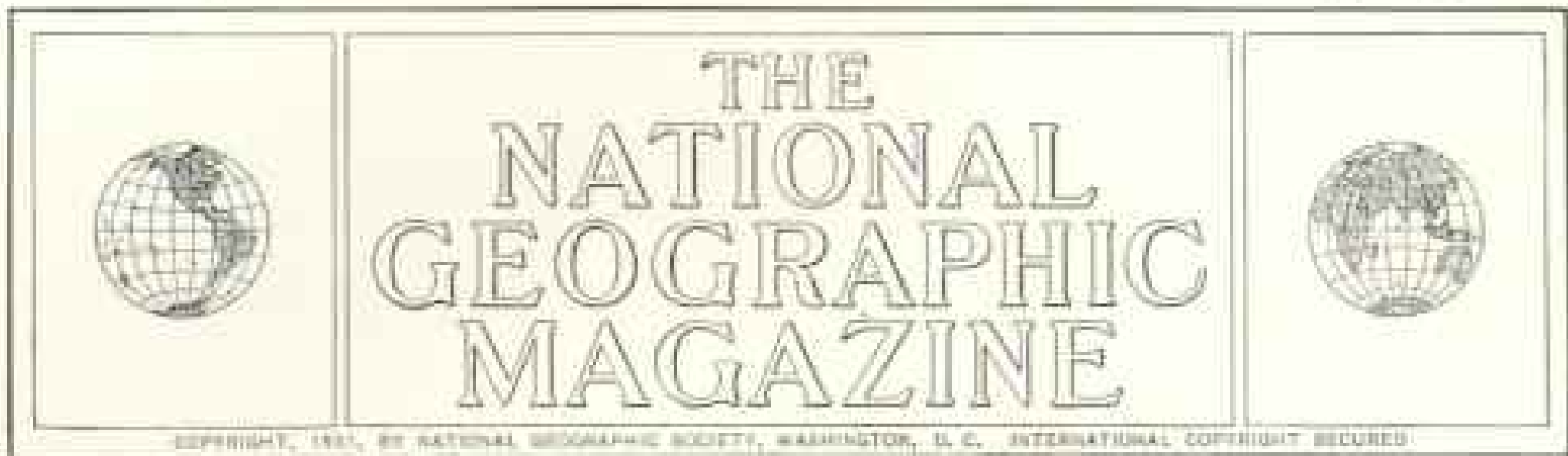
With 27 Illustrations

SYLVANUS GRISWOLD MORLEY

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KONKA RISUMGONGBA, HOLY MOUNTAIN OF THE OUTLAWS

BY JOSEPH F. ROCK

LEADER OF THE NATIONAL GEOGRAPHIC SOCIETY YUNNAN-SICHUAN EXPEDITION; AUTHOR OF "THE GLORIES OF THE MIYA-KORRA," "SEEKING THE MOUNTAINS OF MYSTERY," ETC., ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

With Illustrations from Photographs by the Author

CHINA has long survived its ancient contemporary, the Land of the Pharaohs; yet, even after all the centuries, it cannot see itself as a whole. True, its vast lands are known collectively as China; but, what with the barriers of confused tongues and difficult transportation, some of its areas differ from others, even as Formosa differs from Alaska.

Nor can one say that China is inhabited only by Chinese. In many of its provinces, especially where its Far West blends into that vaguely defined border of Tibet, there live to-day the aboriginal inhabitants of the land. These are not Chinese, but ancient tribes with distinct languages, some possessing a script, even a literature of their own. Such are the Nosu, Nashi, Chungkia, and Miaotze tribes.

In the extreme west the Tibetans in Chinese territory live with their neighbors, the Chrame tribe, a more or less independent existence. Some such tribes are ruled to this day by their own chiefs. A few of the more tractable are under nominal Chinese jurisdiction, governed by hereditary chieftains installed by ancient emperors whose dynasties they have outlived.

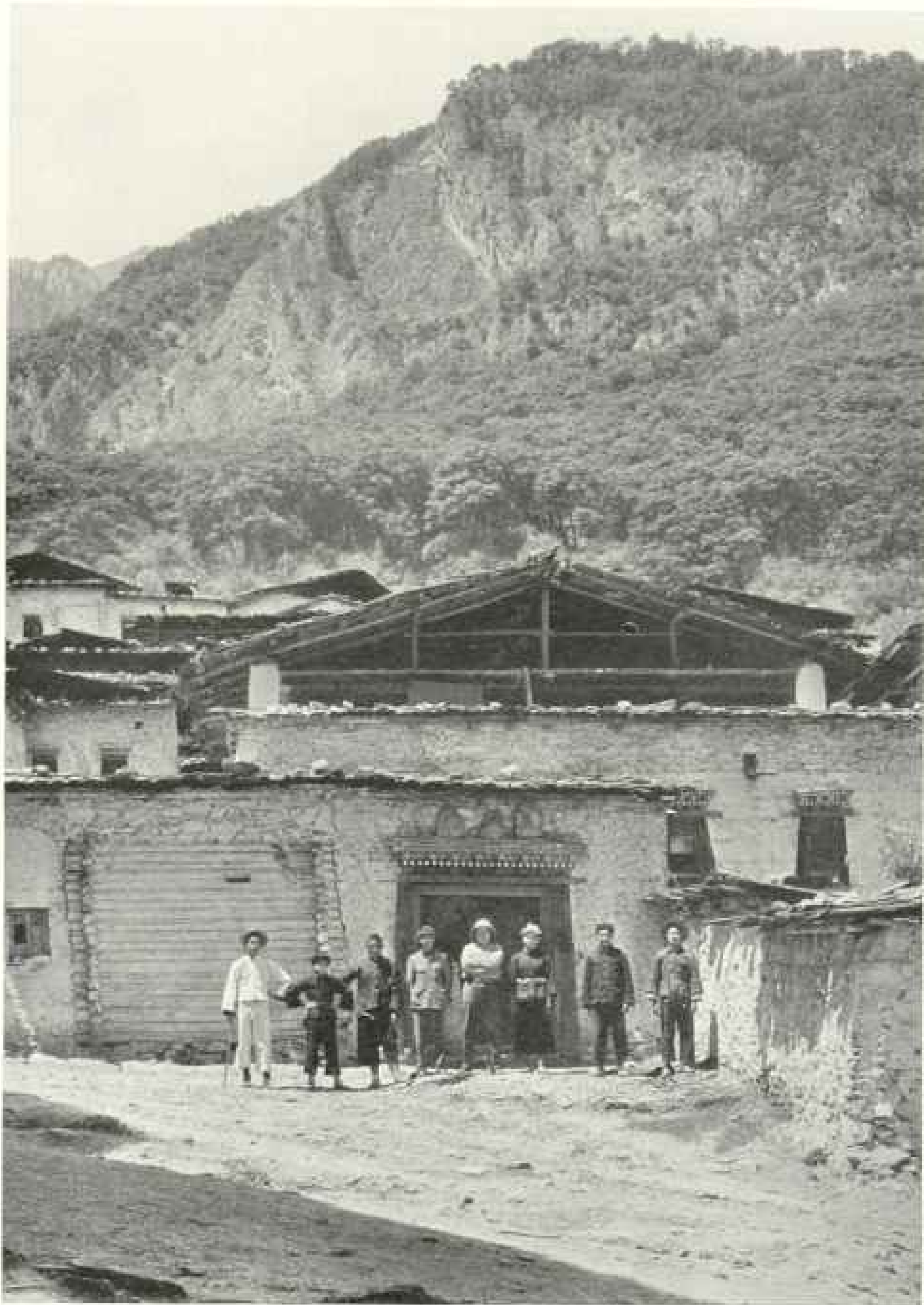
These chiefs are now in fact an anomaly in China, and before long they must become a thing of the past. Their lands usually lie in vast and remote mountains, with

scant agricultural areas, and are therefore unattractive to the Chinese farmer. It is this inaccessibility, as well as the wildness of the tribes themselves, which has deterred the Chinese from occupying or exploiting such lands, although certain of them are rich in minerals.

THE CHINESE HOLD THE ABORIGINES IN CONTEMPT

Vague notions exist, even in Chinese minds, about these tribes and their lands. Habitually the Chinese dismiss these aborigines by giving them a contemptuous nomenclature instead of calling them by their own proper tribal names. Thus the Nosu they call Lolo; the Nashi, Moso; the Chrame, Hsifan, or "barbarians of the west"; and the Tibetans who live west of the Chrame, in Szechwan and Yunnan, are known to Chinese as Mantzu, or "robbers," which is not an inaccurate designation. Often the Chinese characters employed to denote this derogatory nomenclature are prefixed by the radical or ideograph for "dog," to show utter contempt for these aboriginal people.

I have spent many years among the various tribes in western China. I have explored many of their territories, from the southernmost parts of Yunnan to the borders of extreme southwest Mongolia and



THE HEADQUARTERS OF THE NATIONAL GEOGRAPHIC SOCIETY EXPEDITION IN
MULI MONASTERY

The author, with his assistants, is standing in the foreground. The capital of the Land of the Yellow Lama (see the NATIONAL GEOGRAPHIC MAGAZINE for April, 1925) is in reality only a lamasery of 340 houses tenanted by 700 monks, who pray unceasingly. There are three other interesting lamaseries in the kingdom (see pages 11, 12, and 49).



THE CRAGS OF MOUNT MITZUGA

In the foreground is a pond, on the western slopes of the summit which is sacred to Muli Monastery.

the grass lands of northeastern Tibet. Still there remain areas along that vast borderland, such as the homelands of the Ngoloks, the Hsiangcheng, and Konkaling tribes, which are most difficult of access and whose inhabitants have defied Western exploration. Of course, no Chinese dares visit even the frontiers of these lawless bands.

In 1926 I explored the region of the Amnyi Machen Range and the gorges of the Yellow River in the southern Koko Nor, having been the first white man to explore the land between the Yellow River and the Amnyi Machen.*

More recently I was privileged to explore another and even less-known region, the Konkaling district, northwest of the Muli kingdom, where the existence of an

enormous mountain mass, only second in height to Minya Konka and the Amnyi Machen, was then not suspected by the outside world.

On my journey to the lama kingdom of Muli in the winter of 1923, I saw from one of the mountain heights over which my trail led a far-away conglomeration of snow peaks. Later I learned from the Muli king that these peaks were in the land of Konkaling and inhabited by Tibetan outlaws. I could not then venture into that mountain fastness, because the time was winter and because I had not yet established the real friendship of that amiable but stern ruler, the King of Muli.

On my return from an expedition in the Koko Nor for the Arnold Arboretum I arranged with the National Geographic Society to undertake the exploration of this unknown mountain range and territory, hitherto a blank on the map; and it

* See "Seeking the Mountains of Mystery," by Joseph F. Rock, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1930.



A TIBETAN BEGGAR WITH HIS PRAYER WHEEL.

He came into the courtyard of the Expedition headquarters in Muli Monastery and, whirling his prayer wheel, sang at the top of his voice and refused to budge until he had received a piece of silver.

is to the credit of that Society that this *terra incognita* has become geographically known and its unsurpassed scenery pictured not only in black and white, but also in natural-color photographs.

A LAND WHERE ROBBERS TURN FROM PILLAGE TO PRAYER

It was my friend the King of Muli who made it possible for me to explore this region of amazing scenery and pious robbers, who turn from pillage to prayer—and then back to pillage!

Our expedition left Yunnanfu March 23, 1928, with experienced Nashi assistants who had been with me for a number

of years. We went first to Talifu and thence to Likiang, where all preparations were made and additional personnel hired for the journey to the Muli kingdom, ten days to the north. I hoped that we could persuade the lama king to request the bandit chiefs of the Konka-ling and Hsiangcheng to give us safe conduct, so that we could work unhindered on a survey of that magnificent mountain range.

GUNPOWDER BOMBS EXPLODED IN WHITE MAN'S HONOR

On our arrival in Muli we found that the king was residing in the small monastery of Kopati, two days' journey east (see pages 12 and 13). Kopati stands at an elevation of 10,260 feet, on a small terrace overlooking the Kopati Valley. The head lama of Muli Monastery and the king's lama secretary came to escort us from Muli to Kopati.

We left Muli on May 28. The first day out, camp had been prepared by the king's subjects of the hamlet of Gudduh, at an elevation of 10,450 feet. This camp stood on a small meadow surrounded by a forest of oaks and pines, through which we had glimpses of the canyons of the Litang River to the south. Here we were presented with chickens, sheep, and bags of barley, which the peasants had been ordered to bring. In fact, from the moment we entered Muli territory we enjoyed the friendly monarch's hospitality.

Leaving Gudduh early next day, our trail led through magnificent forests of pines dimly outlined in the mist which en-

shrouded us. No wind stirred. Nature was at peace. On that serene morning no voice was heard but the cuckoo's.

A well-graded trail leads to the tiny monastery of Kopati, which no other white man had ever visited. Somber forests of spruce and fir extend from the monastery to the hilltops back of it. As we approached, the few resident lamas and the king's attendant officials were lined up near the monastery entrance, composed of graceful trees and rose vines. The lamas bowed and with outstretched hands bade us welcome.

Although Kopati is one of the most secluded spots on earth, we were surprised to find ourselves in quarters exquisitely painted and decorated with carved doors and windows. We were hardly settled when the king's Chinese writer called. With him and the royal secretary we discussed our plans. The king knew from previous letters I had written him from Kansu that I wanted to go to Tatsienlu through his domain, so he had made all arrangements for such a journey. But the expressions of the two men changed when I said I wanted to explore Konka, or Konkaling. They expressed serious doubt as to our ability ever to explore the range or march around its three peaks, because of the bandits.

I reminded them that we had valuable presents for the Muli king; and, casually passing to the secretary an American twenty-dollar gold piece, the first he had ever seen, I suggested that he diplomatically prepare the king for our unusual



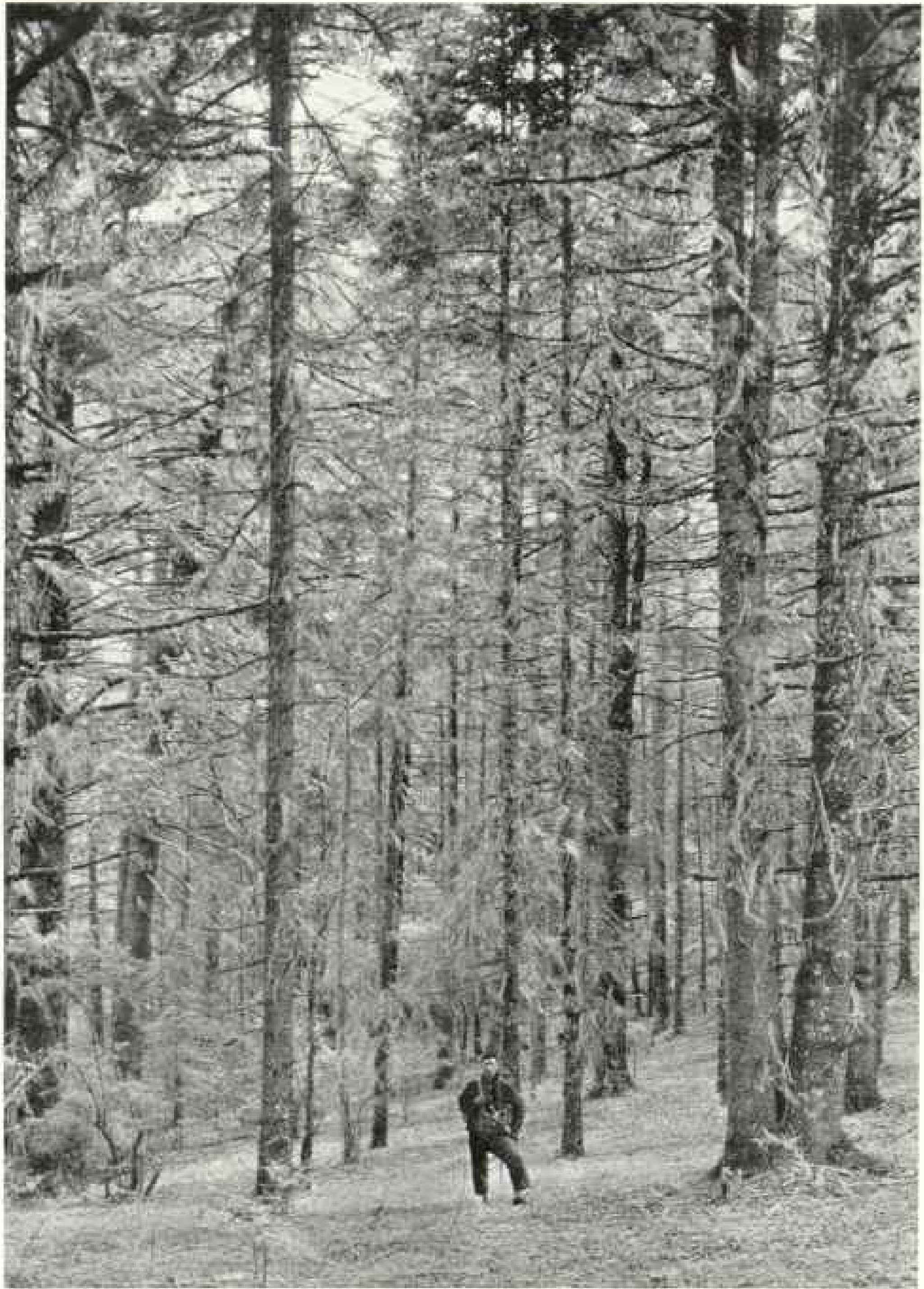
IN A RHODODENDRON FOREST

The white-flowering trees are from 15 to 25 feet tall, with trunks of more than one foot in diameter. Hundreds of varieties of rhododendrons which Dr. Rock has brought back to America from his National Geographic Society expeditions in Asia now beautify parks in many countries. Elevation, 14,600 feet, northwest of Mount Mitzuga.

request. He left, to return after an hour, a smile lighting up his face. This boded well for our plans. Then we were escorted to the palace. On arrival at the massive gate, the lamas exploded gunpowder bombs in our honor and we were ushered upstairs into the royal presence (see Color Plates I and XXIV).

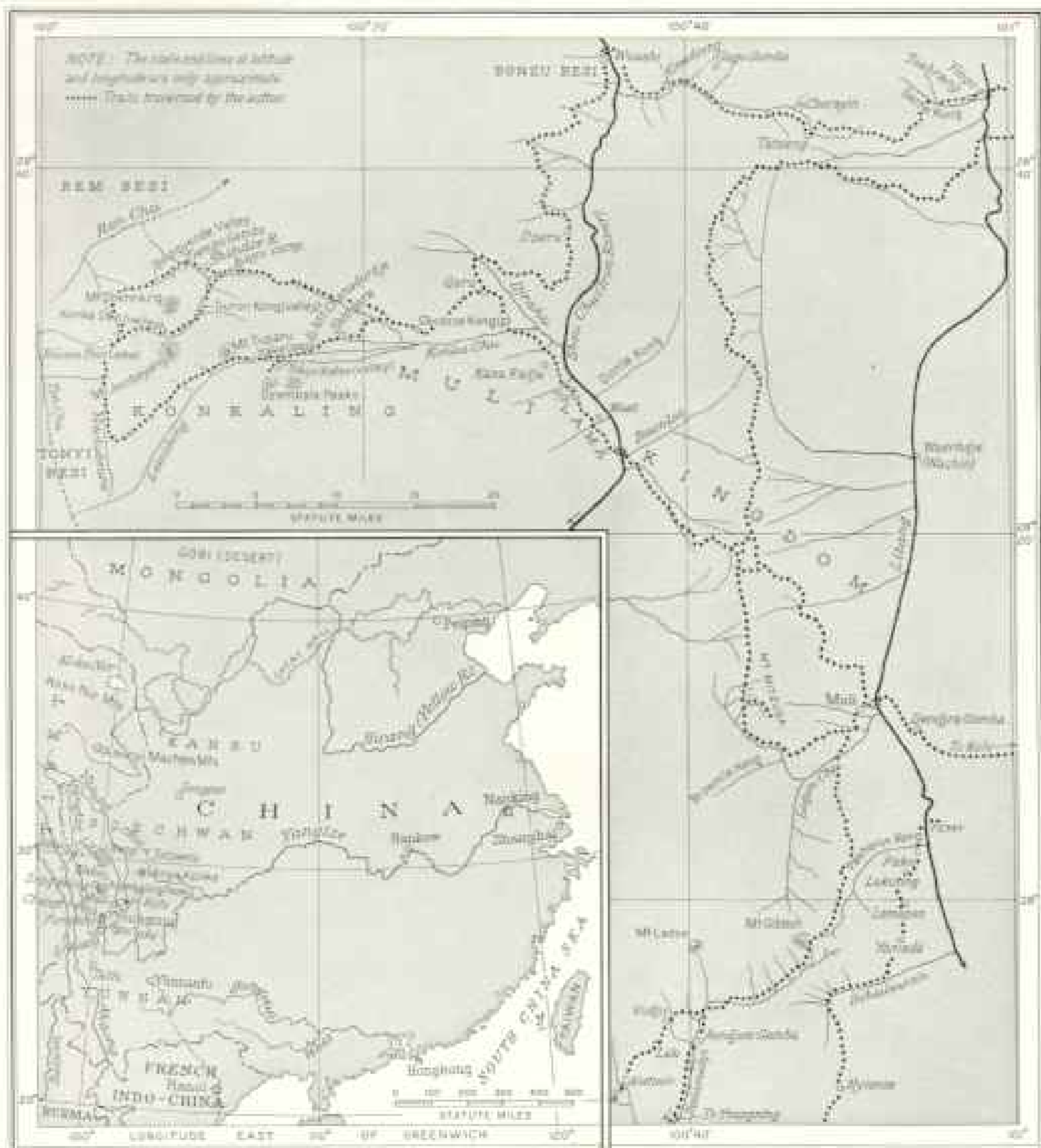
THE GEOGRAPHIC UNLOCKS GATES TO ROBBER STRONGHOLD

Dressed in a yellow satin robe, the king received me, took my hand, and led me to a chair. Two of my assistants had brought forward a number of presents. These



A SPRUCE FOREST ON THE SHOU CHU RIVER WATERSHED NORTH OF
MOUNT MITZUGA

In this region the timber line extends to 15,500 feet. Spruces, larches, and firs are found up to 15,000 feet, while for the remaining 500 feet rhododendron forests composed of trees 25 to 30 feet in height cover the spurs and ridges.



Retraced by A. H. Bonstead from Joseph F. Rock's Field Notes

THE ROUTE OF THE AUTHOR FROM MULI TO THE KONKALING PEAKS

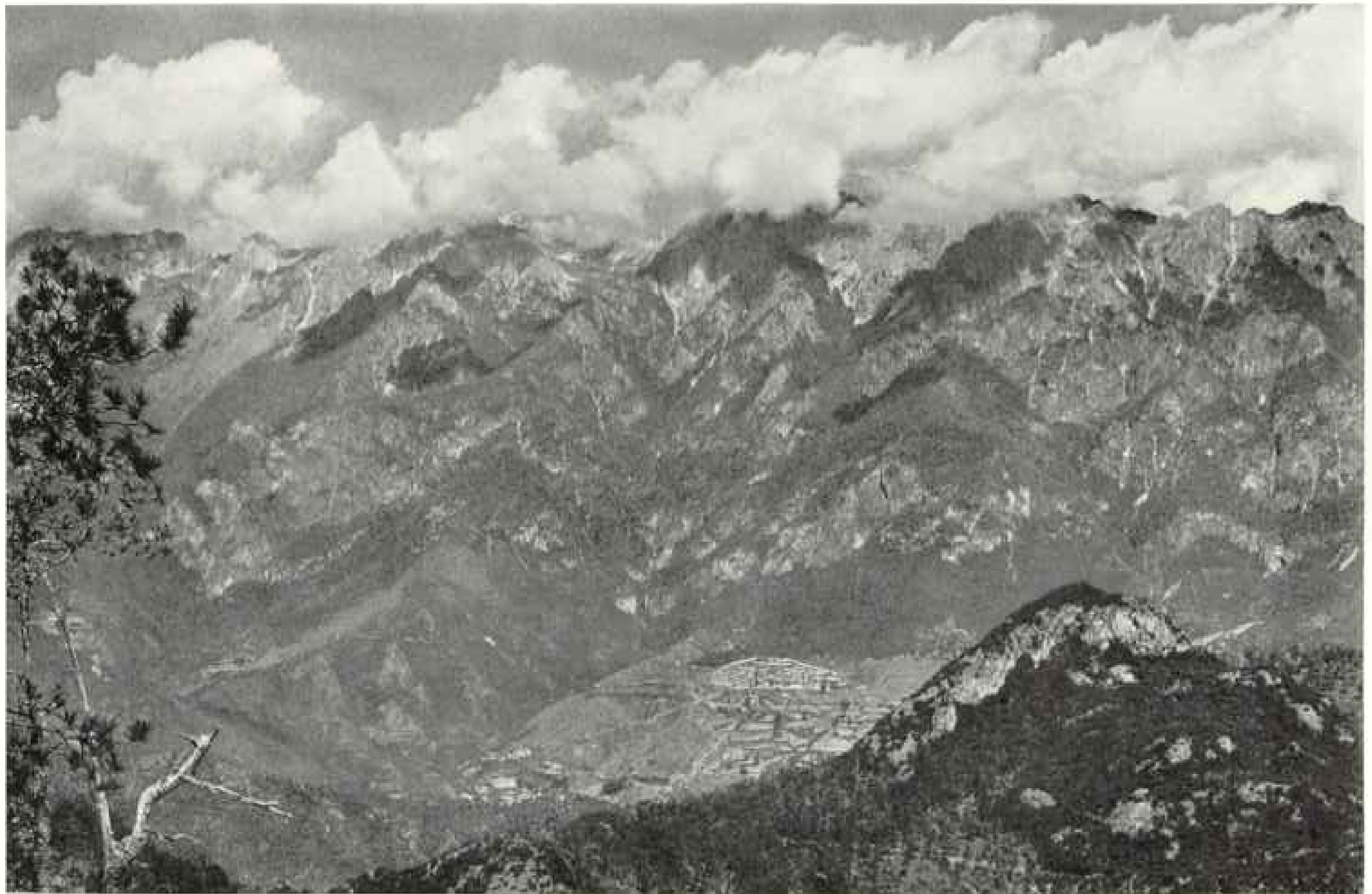
Three of the loftiest and least-known mountain groups in central Asia have been visited and photographed by Dr. Rock—the Amnyi Machen, Minya Konka, and Konkaling (see inset map at lower left). His two earlier surveys have been described previously in the NATIONAL GEOGRAPHIC MAGAZINE (February and October, 1930).

consisted of many articles of foreign manufacture, including an issue of the NATIONAL GEOGRAPHIC MAGAZINE in which had appeared my article on my last journey to Muli, in 1923-24.* These items proved

to be the real key that was to unlock the gates to Konka Risumgongba.

The king's realm is surrounded by lawless bandits. To the south and southeast is the Lolo robber tribe and to the west and northwest are the Konkaling and Hsiangcheng outlaws, who often make inroads into his domain.

* See "The Land of the Yellow Lama," by Joseph F. Rock, in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1925.



MOUNT MITZUGA FROM A SPUR SOUTHWEST OF DJAGO (SEE TEXT, PAGE 27)

In the middle distance is Muli Monastery (see page 2). The spurs in the foreground are forested with *Pinus sinensis yunnanensis* at an elevation of 11,300 feet. Mount Mitzuga is more than 16,000 feet in height. Its limestone crags are hidden in the clouds. Muli, on its slope, has an elevation of 9,600 feet.



LOOKING DOWN THE YANGTZE VALLEY FROM HILIHIN TERRITORY

The Hilihin hamlet of Lakashili, with its terraced fields, can be seen at the lower left. Laposhan, a huge mountain mass of limestone crags and peaks, peers through a rift in the clouds. The semi-independent Hilihin, or Lüshi, are a branch of the Nashi.



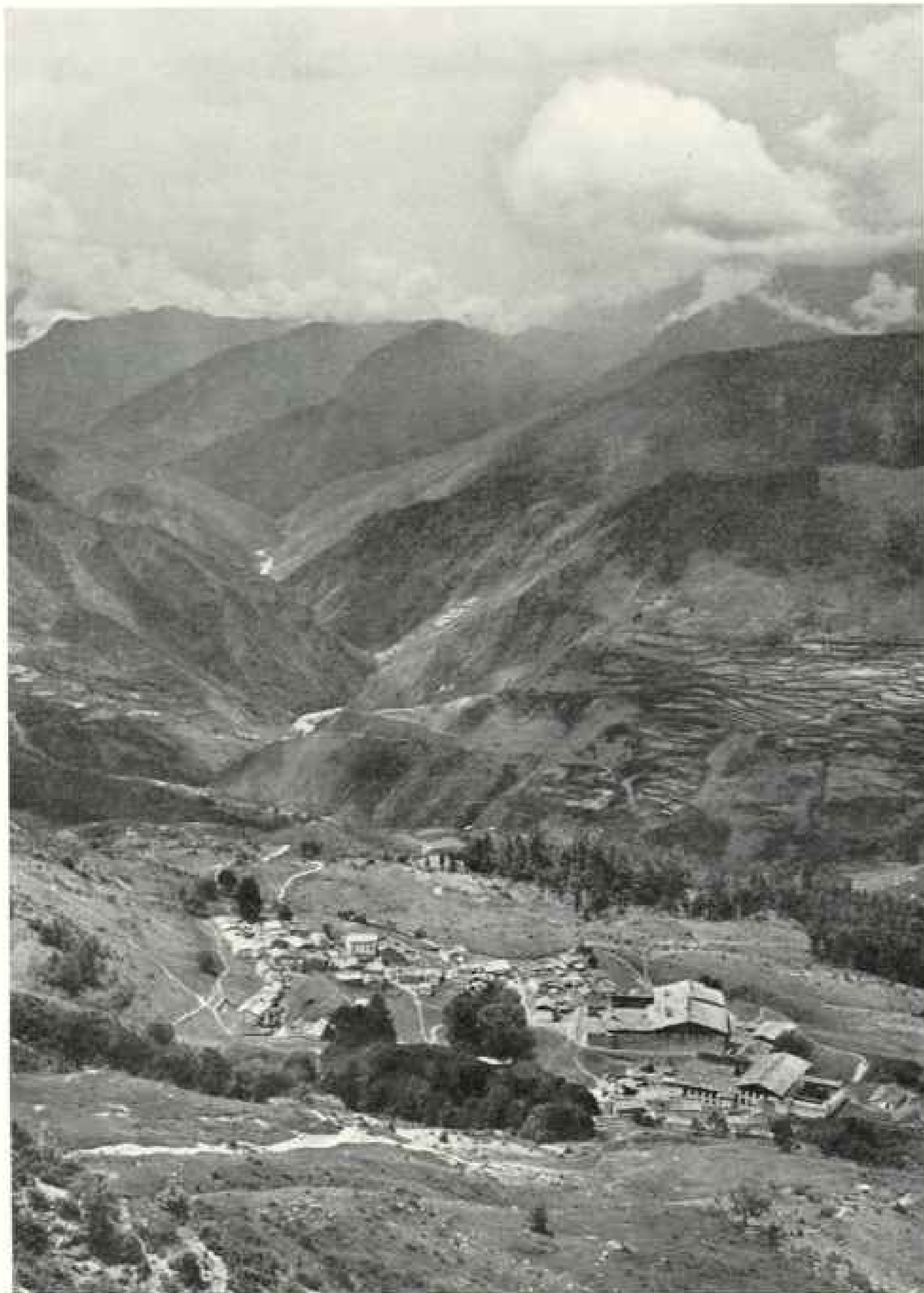
THE MULI KING BEFORE HIS TENT (SEE, ALSO, COLOR PLATE 1)

He had gone three miles ahead to wish the Expedition farewell and to serve luncheon to the author.



THE DIRECTION OF THEIR STRIPES INDICATES THEIR SEX

A group of Hsifan, or Chrame, peasants of the village of Djishi, northeast of Muli. They wear homespun hemp cloth of gray with dark-brown stripes. The men wear the stripes horizontally and the women vertically. The bowed head is a common posture, for they dare not look up to their superiors, the lamas.



LA KANG TING, OR WAERHDJE MONASTERY (SEE, ALSO, COLOR PLATE XXIV), THREE DAYS NORTH OF MULI

Waerhdje, or Wachin, is the oldest monastery in the Muli kingdom. The chanting halls were built more than 400 years ago. The king has a large palace here (lower right) of comparatively recent construction (about 60 years old). The Litang River can be seen in the distance. The last high peak visible in the picture is Mount Mitznga, on the slopes of which Muli Lamasery is situated (see illustration, page 2).



THE OLD CHANTING HALL AT KOPATI MONASTERY, IN MULI TERRITORY

The author was the first white traveler ever to visit this secluded retreat, which is situated two days' march east of Muli (see text, page 5).

The king was exceedingly amiable and friendly; but after I had told him of our plans he expressed grave fears for our safety, even though arrangements could be made with the bandit outlaws who control Konkaling.

THE KING ASKS FOR NEWS OF THE WORLD

We talked a long time. He asked many political questions, which showed that, although he is absolutely isolated from the rest of the world, he is fairly well informed as far as China is concerned. Of happenings in foreign countries he was entirely ignorant. He knew nothing of the Bolsheviki or of the murder of the Tsar and his family, nor that the Kaiser no longer rules Germany.

Taking advantage of this chance to hear world news, the king sent a lama into the recesses of his palace to fetch several cheap

colored prints in wooden frames. One represented all the potentates in power before the World War. This was in the days of King Edward VII, Abdul-Hamid, President Diaz of Mexico, and of our own President Taft. One by one, I had to explain what had befallen each of these men. He seemed astonished that so few had managed to hold on to their leadership. I could see that in his mind there arose a query as to his own security. A king in a republic, even if that republic is China, is after all an anomaly.

The full measure of his knowledge of the outside world was shown when he asked me to explain another colored print which his secretary brought in. It was a scene out of "Puss in Boots," in which a few donkeys fully dressed were walking erect as mourners behind a cat's coffin carried by four rabbits. (Do not ask me how



THE QUARTERS OF THE EXPEDITION IN KOPATI MONASTERY

The house, more than a hundred years old, was a real jewel box, with beautifully carved doors and windows and exquisitely painted walls. One of the king's lama officials, a Nashi, can be seen on the veranda. The lower floor provides storage for the king's provisions; the upper floor is a private chapel.

that juvenile work of art ever reached that remote nook of the world.) In all seriousness he asked me in what country this might be. I laughed and told him it was a picture out of a children's story book; whereupon he gravely nodded and began inquiring about airplanes!

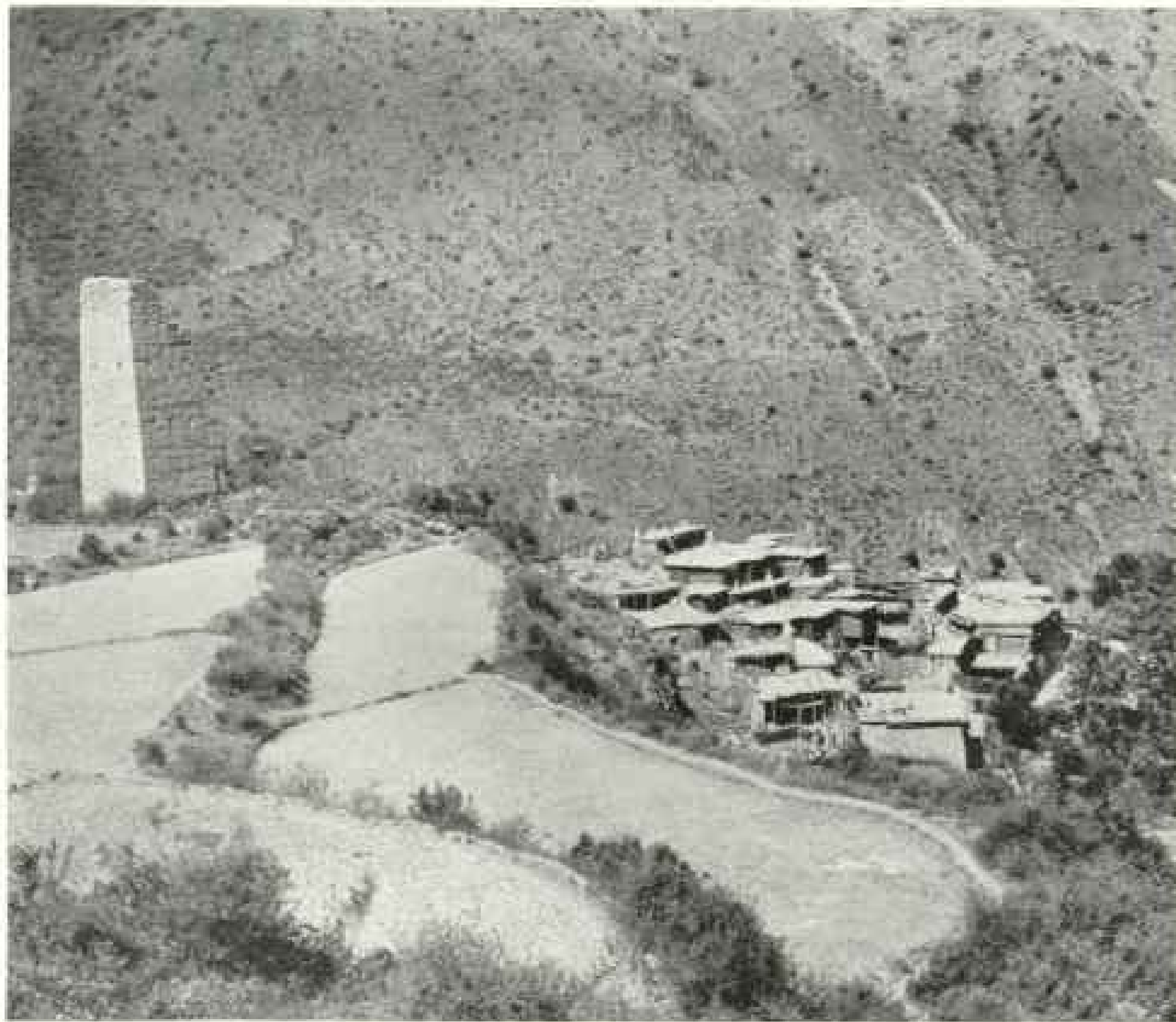
The king, whose curiosity is insatiable, inquired how high people had flown, and if from an airplane flying high over Washington one could see China; and then, again, why my people had never flown to the moon. It was difficult to keep a straight face and answer all his questions seriously.

He now changed the subject and referred to my plans for exploring Konka. He explained that the range is called Konka Risumgongba, after the Tibetan trinity, Chanadordje, Jambeyang, and

Shenrezig, who are said to inhabit the three mighty snow peaks. Konka Risumgongba is the mountain god of the outlaws who dwell around the high plateau from which the majestic peaks pierce the sky (see, also, Color Plate IX).

BANDITS STOP PILGRIMAGES TO SACRED PEAKS

It is the pious wish of every Tibetan to make a pilgrimage to the sacred peaks at least once in his lifetime, circumambulating them, if possible, under the worst weather conditions in order to acquire more merit. The gratification of this wish, however, is now reserved for the outlaws of Konkaling themselves. It is more than twenty years since outsiders have been privileged to make the pilgrimage around



THE VILLAGE OF WOATI, IN THE SHOU CHU VALLEY

The tower to the left was built by the Nashi king, Mutienwang, who 300 years ago controlled this entire territory, including Konkaling, the region northwest of the Mekong, Muli, and parts of Tibet proper. Likiang was his capital (see, also, text, page 34).

the mountain. Should any outsider now venture into Konka land he would be robbed and then slain, after which the Konka outlaws would resume their own pious pilgrimage!

The Muli king blamed the Chinese for this state of affairs. Originally the Konkaling and Hsiangcheng tribal lands were under the rule of a Tibetan prince who had his seat in Litang, between Batang and Tatsienlu. The prince had complete control over his subjects, as has the Muli king to-day over his, and at that time anyone could safely circumambulate the mountain. Hundreds of pilgrims—men, women, and children—then went annually around the sacred peaks unmolested, acquiring merit to their hearts' content. Then came the ambitious Chinese Chao-Erh-feng, with his imperialistic designs. In 1904 he ad-

vanced on Tatsienlu, deprived the King of Chiala of his rank and territory, and then destroyed the princely family at Litang.

TWENTY YEARS OF ANARCHY

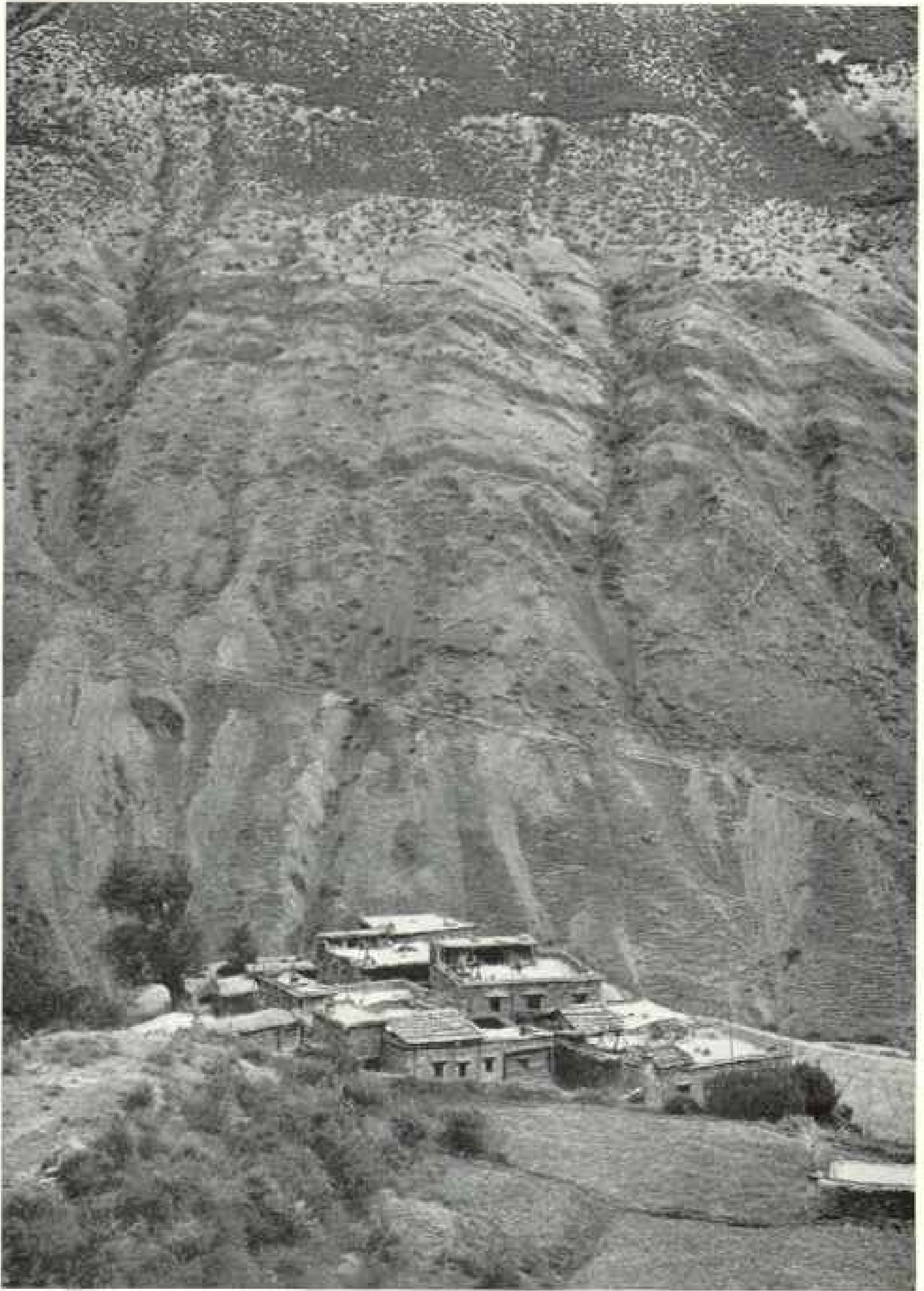
Chao-Erh-feng established 31 magistracies, but only nine are held to-day by the Chinese, the remainder being ruled by Tibetan outlaws. Under the Litang princes the Konkaling and Hsiangcheng territories had been administered by subchiefs, but after the Chinese "removed" the prince of Litang the country became a stronghold of robbers and outlaws.

The Tibetans of this region welcomed the advent of the Chinese military, as it offered them an opportunity to arm themselves. They attacked and murdered the Chinese garrison and seized rifles, pistols, and artillery. Later the Muli king bought



A "SCARECROW" TO WARD OFF EVIL WEATHER

The structure resembling a primitive wireless tower was erected by Hsifan sorcerers. These towers are built once in three or four years and are believed to be especially effective as a protection against hail.



THE VILLAGE OF TURU, IN THE SHOU CHU VALLEY

The villages in this region are conglomerations of rock huts built one against the other, with log-cabin-effect insets and flat roofs of mud, which permit one to step from house to house over the entire village. The elevation of Turu is 9,100 feet.



TIBETANS OF GARU, THE MOST WESTERLY VILLAGE IN MULI TERRITORY

Garu is situated at an elevation of 11,000 feet, on the slopes of Mount Konka. A trail leads back of the village to Mount Chauadordje, the third highest peak of the Konka system. Before the accession to the Muli throne of the present king, the Garu people were outlaws and even came in force to attack Muli Monastery, but stern measures adopted by the present monarch have recently brought them into comparative submission (see text, page 27).

two fieldpieces from the outlaws. Thus the country became an armed bandit camp.

The magistrates whom the Chinese had appointed as civil rulers of the newly acquired territories were looked upon by the Tibetans as harmless individuals. At first they were left unmolested, especially as they were not always stationed in the region to which they were accredited, but near its borders. Now, however, no magistrates remain, the last official having fled to avoid the fate of his predecessor, who was murdered in cold blood by outlaws.

Now the Hsiangcheng tribal lands are as independent as those of Konkaling. They are ruled by Sashatimba, a bandit chief who holds forth at the Sangpiling Monastery. Other bandit chiefs assist Sashatimba to rule the land. Together they loot and rob and murder. They even go on journeys of many weeks to hold up caravans or loot peaceful settlements. No Chinese dares to enter the Konkaling or Hsiangcheng territories.

Thus, all because the Chinese abolished the princes of Litang, twenty years of anarchy have followed and commerce between Tibet and China via Batang, Litang, and Tatsienlu has ceased. Anyone traveling on the Litang-Batang highway has to make his own arrangements with the Tibetan bandits.

BANDIT POWER HAS GROWN AND SPREAD

Konkaling territory is divided into three districts, each ruled by a *besi*, or headman. They are, in the order of their importance, the Bonzu Besi to the east, the Rem Besi to the north, and Tonyi Besi to the southwest. The last named borders on the Londa River in Muli territory. The Tibetan chief ruling the three headmen and their districts has, however, come under the sway of Drashetsongpen, a Hsiangcheng bandit chief and former lama of Chungtien Monastery, in northern Yünnan.

Drashetsongpen, after abandoning the priesthood and surrounding himself with

outlaws, made himself absolute ruler of Konkaling, with headquarters at the monastery; yet he told me he could only control those whom he could see. This speaks volumes for the character of his subject bandits.

Drashetsongpen's bands go up and down the land, robbing caravans as far from his stronghold as Tatsienlu to the north and Likiang, in Yunnan, to the south. His older brother, Mahoshan, whom I had the doubtful pleasure of meeting, also travels the same territory, posing as a peaceful merchant but selling the loot which his brother accumulates from robbing the caravans.

The loot from the northern regions, mainly furs, musk, and rugs, is sold in the south, as in Likiang. The valuable opium from Yunnan, usually looted from Likiang caravans, is sold in Tatsienlu, where it fetches a high price.

When there are few caravans to be robbed, Drashetsongpen gathers his outlaws, often as many as six or seven hundred mounted men, and robs his neighbors. Frequently he even boldly attacks the large town of Likiang. Being on friendly terms with the Muli king, he rides the king's roads. He thus crosses Muli territory and attacks either Youngning and the Hihin tribes or the Tsoso and Chienso chiefs in Szechwan. For years this bandit power has grown and spread, till no so-called lawful authority seems now able to suppress it.

A BANDIT STRONGHOLD AMID SENTINEL PEAKS

While we were preparing for the journey to the three sacred peaks, the Tonyi Besi people decided to take vengeance on the helpless Tsoso people. The grievance was an imaginary one. A so-called Living Buddha of the Tonyi Besi district who had taken up his residence in the Tsoso territory died a natural death there; but the Konkaling outlaws, ever ready for an excuse to rob, declared that the Tsoso people had killed the Buddha to obtain the accumulated gifts presented by innumerable devotees. It may be added that this looting expedition was their second for the same alleged cause! The Muli king loaned the Tonyi Besi outlaws his roads, and so did the Youngning chiefs—the latter out of fear, the former out of friendship and perhaps gain.

While we were among the sacred peaks, the Tonyi Besi had made a dash to Tsoso land. This necessitated their crossing the Shou Chu River, where they left fifty bandits to guard the cantilever bridge, and thus keep their retreat open. A hamlet and yamen, or official residence of the Tsoso chief, were partly burned and many yak, sheep, domestic cattle, horses, and mules driven off. These the Konkaling bandits managed to take to their stronghold, among the majestic peaks which tower like huge sentinels over Konkaling. A few straggling sheep which could not keep up with the departing bandits were picked up by the people of Youngning. As was natural, these were not restored to their rightful owners, as it was difficult for such simple-minded people to decide who their rightful owners were.

This news came to the ears of the Tonyi Besi, who felt much outraged that the Youngning people, whose territory the Konkaling bandits had peacefully crossed to inflict punishment on the Tsoso clan, should dare steal these looted sheep. They demanded seventy head of yak as indemnity. In case this were not promptly paid, they would come and, to quote the Tonyi Besi, "burn Youngning to the ground and kill every man, woman, and child of the Hihin tribe."

The Muli king, more powerful than the Youngning people and spiritually a person to be reckoned with, usually receives a part of the loot for lending his roads to the outlaws. This keeps his domain more or less immune from their attacks. Yet shortly after our sojourn in the Muli village of Wuashi the robbers came, destroyed the wooden bridge over the Shou Chu, then massacred the Tibetans of Wuashi, and looted and burned the village.

The Muli king's domain is like an unfenced penitentiary, for none of his subjects is allowed to leave the country, and even Chinese with families who remain a year in the kingdom become automatically subjects and are henceforth forbidden to quit the Muli borders. Peasant is set to watch on peasant, spy and report. Hence their everlasting cringing and crawling in the presence of the king and even before his lamas.

Such a condition does not foster boldness or a fighting spirit; so, as a defense force, the king's subjects are not to be

WITH THE DEVIL DANCERS OF CHINA AND TIBET



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Natural Color Photograph by Joseph F. Rock

THE KING OF MULI HOLDS SPIRITUAL AND TEMPORAL SWAY OVER 22,000 SUBJECTS

His power is absolute in a territory about the size of the State of Massachusetts. The robes he wears are those of a Living Buddha, and the temple banner directly behind him is a representation of the entire Tibetan pantheon.



NASHI SORCERERS PERFORM A MYSTIC CEREMONY

Tribal wizards have more than fifty different methods which they employ to propitiate or drive out demons reputed to cause illness and bad luck.



© National Geographic Society

Natural Color Photographs by Joseph F. Rock

MILITARY OFFICERS OF THE "GOD OF HEAVEN" DEFEND THEIR MASTER

The celestial deity is seated on the table between the dancers. As a climax to their performance they kill his enemy, the Demon King.

WITH THE DEVIL DANCERS OF CHINA AND TIBET



A NASIH FARMHOUSE ON THE LIKIANG PLAIN.

Everywhere in this part of the world great snow-clad mountains dominate the landscape. Most of the people are very poor and their houses unpretentious.



© National Geographic Society

Natural Color Photographs by Joseph F. Rock

RHODODENDRONS LEND COLOR TO THE HILLS OF NORTHWEST YUNNAN

This, the *Rhododendron bellotepis*, is one of the more common species and is usually found in spruce forests at an elevation of about 13,000 feet.



© National Geographic Society

Natural Color Photograph by Joseph F. Rock

THE NATIONAL GEOGRAPHIC SOCIETY EXPEDITION ENCAMPED TWO MILES ABOVE SEA LEVEL

Behind their tents, open groves of Yunnan pines reach to the lower slopes of the mountains. The snow-capped peak at the right is 19,000-foot Mount Djina-Lo-Ko.



© National Geographic Society



Natural Color Photographs by Joseph P. Rock

NASHI TRIBESMEN, COURAGEOUS AND HELPFUL ASSOCIATES

The leader of the National Geographic Society Expedition attributed much of the success of his explorations to these intrepid mountain men who could be trusted to remain loyal in time of danger. Behind the Nashi boys are robes made of the skins of leopards (*Felis pardus*), fierce arboreal animals which range over most of Asia.



A VIEW FROM THE ISLAND OF NYOROPHU IN YOUNGNING LAKE.

Lion Mountain rises across the water. The small house at the end of the island was occupied by the leader of the National Geographic Society Expedition at various times while sojourning in the Hihia tribal lands.



© National Geographic Society

Natural Color Photographs by Joseph F. Rock

HANDITS SOMETIMES MENACE THIS PEACEFUL SCENE

The residents of Nyorophu (see above) have placed a barricade of sunken pine trees around the island to prevent surprise attacks.

WITH THE DEVIL DANCERS OF CHINA AND TIBET



A TIBETAN RESIDENCE OF THE COMMANDER-IN-CHIEF OF MULI'S ARMY

Trashi Konser, so called after a large and famous building in another part of Tibet which it is said to resemble, is 11,000 feet above the sea. Members of the Expedition were twice guests of its owner (see, also, Color Plate XV).



© National Geographic Society

Natural Color Photographs by Joseph F. Rock.

TINY FARMS SNUGGLE AT THE BASE OF LIRIANG'S SNOW PEAKS

Pine log racks are a feature of most of the farms in this district. They are used for drying corn and wheat in the open.



HERE SENEGAMU, PATRON SAINT OF THE HLIHIN TRIBE, IS WORSHIPED

The shrine is on the island of Nyorophu facing Lion Mountain (see Color Plate VI). In front of it is a sacrificial chimney where pine branches are burnt. Gongs hang on the trees and prayer flags are stretched between them.



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Natural Color Photographs by Joseph F. Rock

HIS ANCESTORS MARCHED WITH KUBLAI KHAN

When the great Mongol Emperor marched through the territory about Younning, A. D. 1253, he left one of his relatives to rule the Hlihin tribesmen. The gentleman astride the pony proclaims himself a direct descendant of that first Mongol ruler (see, also, Color Plate XIV).

counted on. His only worthy soldiers are those recruited among his Tibetan subjects in the village of Garu, on the border of Konkaling territory. They are a fearless lot, yet neighbors of the outlaws of Konkaling. In times past they have been very arrogant and once even attacked Muli Monastery (see, also, page 43).

The present king, a more fearless man, caused a number of the Garu Tibetans to be decapitated and seven to have their big tendons cut below the knee, to make them cripples for life. The Garu people, however, often do a little raiding of their own across the Konkaling border.

Such was the country we had set ourselves the task to explore. It can be seen why Konka Risumgongba had remained a *terra incognita!*

HIS MAJESTY WRITES TO BANDIT CHIEFS

Happily, the king was then on friendly terms with Bandit Drashetsongpen; so he agreed to write letters to all the big thieves of Konkaling, including Drashetsongpen. He wrote very strong letters, stating that an American expedition wished to visit Konka Risumgongba and to circumambulate the peaks. He requested that orders be given to their subject bandits to leave us severely alone.

While the king assured me that we would have little to fear and could circumambulate the mountain, he begged me not to stay too long on its western slopes. He insisted that we go around as quickly as possible and avoid the monastery of Konkaling proper, situated several days' journey to the west of Konka. Konkaling, meaning "Snow Mountain Monastery," houses 400 monks always alert to rob, going out periodically on plundering expeditions, then returning to prayers.

We had to allow time enough for the king's letters to reach the robber chiefs of Konkaling. Being then in no great haste to get to the mountain, we accompanied the king from Kopati to Djago, where his brother-in-law, who is commander-in-chief of his army, resides. I could not learn how this Tibetan of low origin, once a horseboy and later cook to the king, rose to his present high position. Every lama I asked evaded my questions, at first looking puzzled and then smiling and professing ignorance. It was, however, whispered to me that once Mr. Chang, which is the

commander's Chinese name, followed the lucrative profession of banditry. His daring apparently brought him the commandership of the king's forces (see Color Plate XV).

We left Kopati on June 1 for Djago, whither the king preceded us by a couple of hours. The trail led first through dense virgin forest of spruce and hemlock, with rhododendron undergrowth. Finally it emerged into a tree-fringed, circular basin, in the center of which stood a massive house called Trashi Konser, so named after a famous Lhasa palace (see Color Plate VII). Here we were welcomed with the explosion of more powder shells and ushered into the mansion, where we stayed some time to give the Konkaling bandits a chance to digest the contents of the king's letters. No reply came from them, and in due time we went on to Muli Monastery and made final plans for our eventful journey.

OFF AT LAST

June 13 we quit Muli with 36 mules and horses and 21 Nashi assistants; also, we took a soldier escort and a most useful person, the head lama of Muli Monastery, detailed to the expedition by the king. This lama was like a magician in fairy tales. Without him we would have starved. Of course, we paid for everything; yet only through his commands and influence could food be obtained in that lean and hungry country (see Color Plate XXIV).

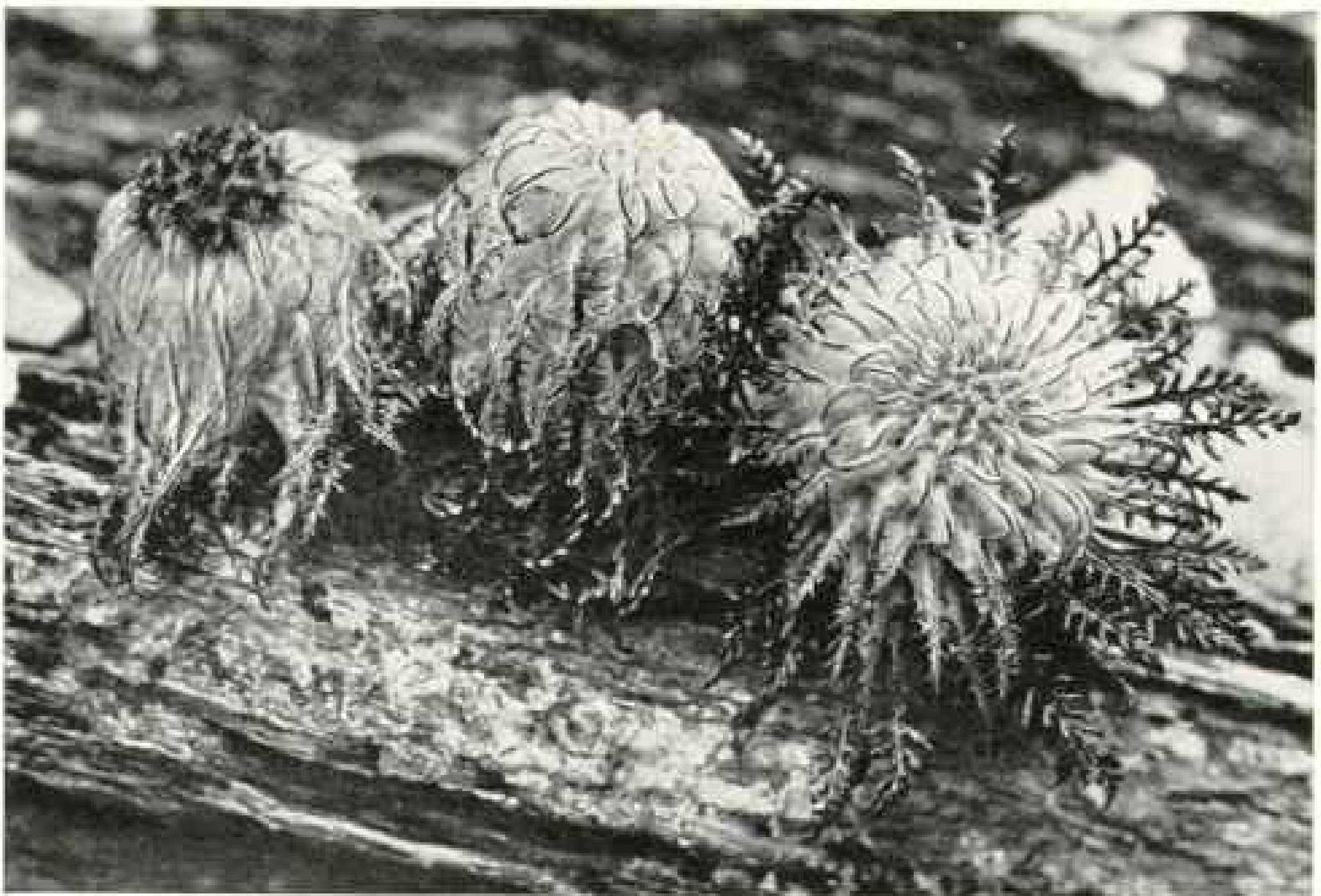
From Muli we made our way around Mount Mitzuga, the mountain god of the Muli people. Back of the fantastic limestone crags which form the crenelated crest of that 16,000-foot range we made our first camp, among alpine ponds nestling in beds of purple-flowered rhododendron bushes, with lovely primulas encircling the loamy banks like huge wreaths. Among the crags are rare birds, including a large rose finch peculiar to altitudes of 15,500 feet. Here, also, is the home of *malu*, or wapiti, a species of elk which the king protects, forbidding his peasants to kill it under penalty of a severe beating with wooden paddles!

Larches form the last tree-growth on the western slopes of Mount Mitzuga. Here the air is cool and pleasant; the trail leads down zigzag through wonderful forests of firs, spruce, and oaks, with many species of rhododendron undergrowth. Various



A HUGE, BEAUTIFULLY ARRANGED SCRIPTURE MONUMENT

The upper structure is composed of circular rock platforms on which rest the laboriously carved schist slabs. The mounted *Muli dutsau* (the king's representative) who erected this sacred pile is at the right.



SAUSSUREAS GROWING AMONG SCHIST AT AN ELEVATION OF 16,500 FEET

The flower heads in the center of the cone are purple, the rest is white to whitish gray. It grows in company with *Meconopsis*, a blue poppy, and a blue-flowered crucifer. It is, however, the last plant to be found on the slopes of Mount Jambayang (see page 65).



THE CANTILEVER BRIDGE OVER THE SHOU CHU AT SHENDZONG (SEE PAGE 34)

Shortly after this photograph was made, the rickety bridge was swept away by the rising waters, and the Expedition had to make a detour north on the borders of Bonzu Besi territory.

green shades of the trees contrast marvelously and are enhanced by long streamers of pale-yellow lichens (*Usnea longissima*) which festoon every branch. The clear atmosphere and the many varicolored rhododendrons, with their undergrowth of primulas and peonies, form indeed a garden fit for gods (see, also, Color Plates III, XXII, and XXIII).

The trail finally leads to the yellow pines, which cover the Shou Chu Valley in its upper slopes. The Shou Chu, or Iron River, its name being derived from its iron-bearing soils, flows at the very foot of the Konkaling Range, some 10,600 feet below the peaks (see Color Plate XXII). Above, ice and snow, and glaciers; along

the Shou Chu, a temperature of 102° Fahrenheit.

The sources of the Shou Chu, hitherto erroneously believed to exist in the Konkaling peaks themselves, are actually eleven days' journey to the north, in Hsiangcheng territory, and flow parallel to the Litang River in terrific gorges. Several of its tributaries, however, flow from the Konkaling Range, such as the Ren Chu, Ton Chu, and Konka Chu. All these rise in the Konkaling peaks.

THE FIRST WHITE MAN TO VISIT THE KONKALING PEAKS

Our party was the first to set foot on the Konkaling plateau, explore the majestic



ALPINE TRANSPORT ON ITS NATIVE HEATH

Sturdy yaks, as well as mules, frequently aided in the solution of transportation problems in this mountain country.

peaks rising from it, follow its rivers and gorges, and climb to its glaciers. In 1909 Jacques Bacot visited the Konkaling Monastery, several days' journey to the northwest of the peaks, *en route* to Sangpiling; but he was not "favored by the gods," for he met torrential rains and never learned of the existence of the peaks. Neither H. R. Davies nor E. Kingdon Ward, both of whom saw the peaks from a distance, was privileged to visit them. Davies, in his book on Yunnan, mentions these peaks, but not by name, nor does he show them on his excellent map of Yunnan Province. He glimpsed the Konkaling peaks when marching from Kulu to Muli, but makes no further reference to them.

We found the stifling heat in the gorges of the Shou Chu next to unbearable, especially as we passed from cool forest regions to a temperature of over 100° Fahrenheit within a couple of hours.

The Hsifan tribe, in Muli territory proper, do not frequent the Shou Chu Valley, which is inhabited by the Shuhin, or Iron People. The Shuhin are of Nashi origin, but speak a language of their own, which seems to be a mixture of Nashi,

Tibetan, and Hsifan; yet it is not understood by any of the three.

Before descending from the region west of Mount Mitzuga into the Shou Chu, our trail led over alpine meadows at an elevation of 15,000 feet. Here we found a great variety of wild flowers—anemones, blue poppies, and many primroses of all colors, forming a veritable carpet of exquisite designs. Our journey would have been enjoyable had we not been attacked, every time the sun appeared from behind a cloud, by huge horseflies, which preyed not only on our animals but on us. Our caravan traveled rapidly, for the flies made our mules step lively.

DIFFICULTIES OF A COLOR PHOTOGRAPHER IN THE FIELD

Having exposed several color plates of the wonderful alpine meadows and of our camp, we halted to develop them in the rhododendron forest which surrounded us. Tying our black developing tent to the branches of rhododendrons in the dense shade of the large trees, then laden with wonderful pale pink flowers, I started developing the plates.



THE AUTHOR AND HIS OUTLAW ESCORT

The leader of the Expedition to the Konkaling Peaks stands in front of his tent, on the southern slopes of Mount Jambayang, at an elevation of 15,100 feet.



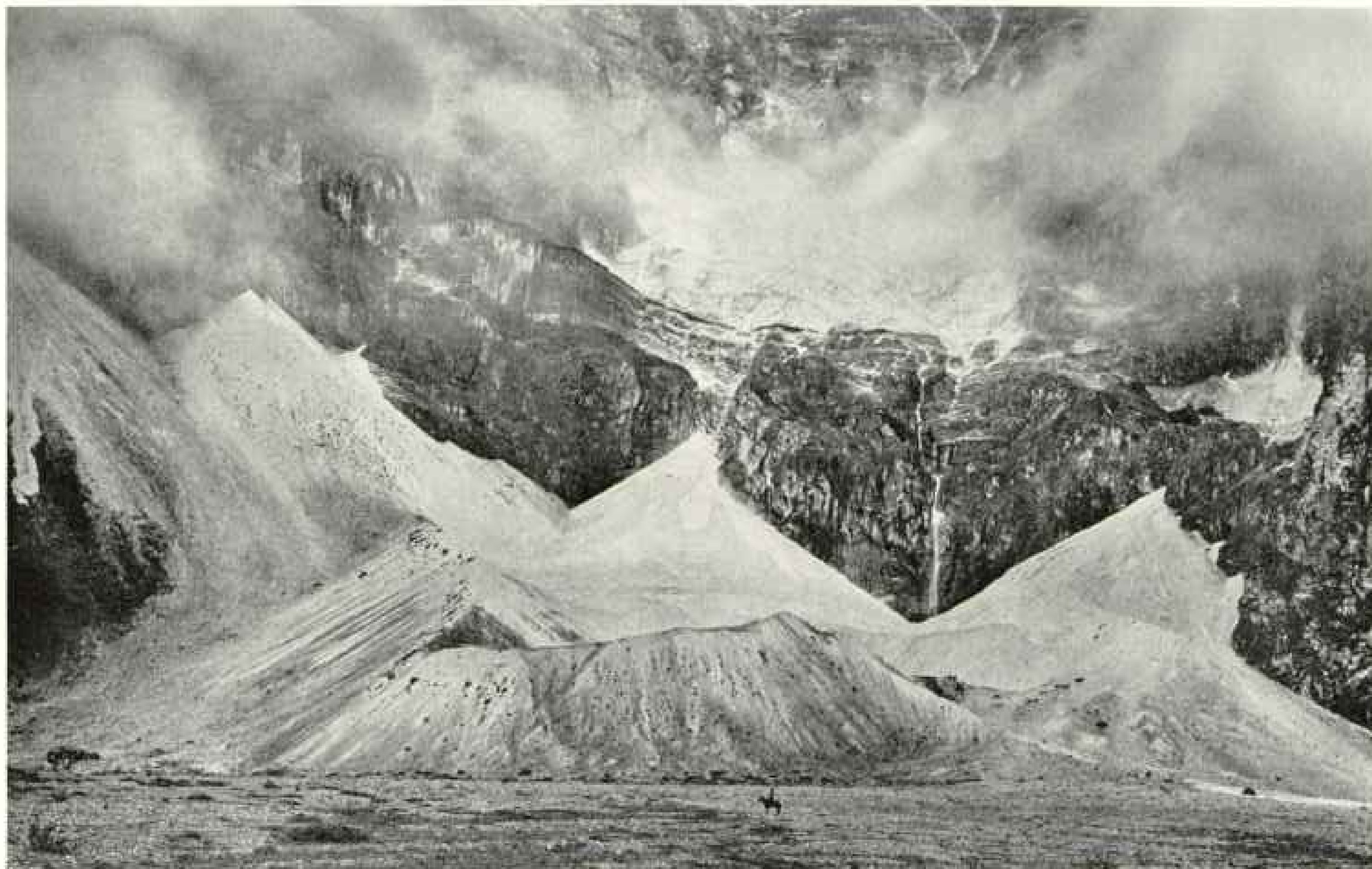
PILGRIM OFFERINGS IN LAWATONG VALLEY

Every devout traveler who passes by this place erects one of these little stone towers, or is satisfied to add a stone or pebble to the structures and thus obtain merit.



THE ENTIRE KONKA SYSTEM, SHOWING ALL THREE MAJOR PEAKS

From left to right, Jambayang, Shenrezig, and Chanadordje, photographed from a point west of Mount Mitzuga, from an elevation of 14,000 feet, using only the front lens of the camera.



THE GLACIER MORAINE OF MOUNT CHANADORDJE, OF THE KONKA GROUP

Konka Djra-use, the Sea Dragon's Snout, is the source of the mighty stream Konka Chu. The foot of the glacier is at an elevation of 14,400 feet.

We had to filter the water through clean absorbent cotton to eliminate impurities. Color plates are hard to handle, even in a well-equipped laboratory, and in a tent without light or running water, in a camp at 14,500 feet elevation, the difficulties were multiplied manifold. The drying of the plates was particularly difficult, owing to the cool, moist air and the myriads of midges and flies bent on resting on the emulsion, where they became entrapped. I ordered one man to keep a cardboard waving over the plates, to drive the insects off, but the air current dislodged tiny specks of humus or moss from the rhododendron trunks, often spoiling the results.

In Muli land the timber line extends to 15,500 feet. Spruces, firs, and larches are found up to 15,000 feet, while for the remaining 500 feet vast rhododendron forests composed of trees 25 to 30 feet in height cover the spurs and ridges.

GOLD IS MINED ON THE SHOU CHU

From Camp Gobotsi, on Mount Mitzuga, we descended through magnificent virgin forests of spruce and hemlock with marvelous rhododendron undergrowth into pine forest to Rutuh, the last Hsifan hamlet on the northern slopes of Mount Mitzuga. From Rutuh down, the land becomes arid and the temperature unbearably hot as one descends to Shendzong, the first Shuhin hamlet. At the spot where an iron chain bridge once spanned the Shou Chu, there is now a cantilever bridge not worthy of that name. The two log extensions from the river banks sag terribly on one side and the three narrow planks which span the central part of the bridge are loose. There is no railing to help keep one's balance; the loose planks act like springboards, swaying at every step—one down, one up (see illustration, page 29).

Below, in its rocky chasm, several thousand feet deep, roared the muddy waters of the Shou Chu, a terrific torrent with whirlpools. The wind howled hot, as from a furnace. That we lost nothing crossing that apology for a bridge was indeed a miracle, when one considers that even seasoned muleteers passed over the precarious structure on hands and knees. A Shuhin would lead a loaded mule to the edge of the central span and, abandoning the loaded, swaying mule, make hastily for the other side.

The trail leads steeply along the almost vertical valley walls of the Shou Chu, from terrace to terrace, on which the hamlets of the Shuhin tribe are built. Tiny strips of land are planted to rice or maize.

The Shou Chu is rich in gold, which was mined here by Mutienwang, the great Nashi king, several hundred years ago. Gold washing and mining activities are now carried on by the Shuhin along the river bank as well as high up on its steep valley walls.

The channel of this river bed might be a source of much treasure if dredging operations could be carried out; but here all work is still done by human strength, and the resources of this rich country are not even touched.

The district below Shendzong is called Lamā and comprises several Shuhin villages, each guarded by a watchtower erected hundreds of years ago by the once powerful Nashi kings. All Shuhin villages are peculiar conglomerations of huts built one against the other, with flat roofs, permitting one to step from house to house over the entire village (see, also, page 16).

At Lamā we camped among boulders in a veritable yellow jasmine bower, which caused me to christen the place "the Jasmine Camp." At 10 p. m. the thermometer still registered 80° Fahrenheit.

Mani piles—huge circular pyramids of rock slabs engraved with the sacred prayer, *Om mani padme hum*—extend row upon row from one village to the next, testifying to the great leisure of the lama monks, who are responsible for their presence (see Color Plate XVII). High above the roaring torrent, on a tiny terrace overlooking the valley in both directions, stands the tiny Yellow lama monastery of Kana Radja, with twenty monks. They lead a monotonous existence, ever praying and turning wheels and mills of prayers and chiseling prayers into every available flat rock surface.

From Kana Radja the trail leads down and over a spur to the Djrahu, which speeds on to the Shou Chu Valley. Then the trail leaves both the river and the Shuhin tribe.

IN COUNTRY NEW TO WHITE MEN

We were now on unknown ground, never before trodden by the foot of white man. My Nashi assistants and our lama



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Natural Color Photograph by Joseph F. Rock

A MULLI TEMPLE BANNER DEPICTS THE SACRED TRINITY OF RISUMGONGBA

In the center is Shenpenpaig, whose earthly incarnation is the Dalai Lama of Lhasa; at the lower left is the God of Learning; and, lower right, the Holder of the Thunderbolt. These gods are supposed by Tibetans to dwell in the three peaks of the mountain mass known collectively as Risumgongba, which Dr. Rock and his National Geographic Society party circumambulated.



HLIHIN TRIBESMEN ARRAVED FOR BATTLE

Residents of Youngning, they must be constantly on the alert against attacks by the Konkaling bandits. The man in the center is the chief's son.



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Natural Color Photographs by Joseph F. Rock

FEMININE ARISTOCRATS OF YOUNGNING

Their embroidered jackets are of satin, embellished with silver and gold. The huge "earrings" are silver and are attached to a strand of hair (see, also, Color Plate XIII).

WITH THE DEVIL DANCERS OF CHINA AND TIBET



THEY SERVE THE PRINCE OF DARKNESS

The two outside figures represent the Deer, or Showa, spirits. All of them assist the ruler of the Nether World in torturing souls of departed beings.



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Natural Color Photographs by Joseph F. Rock

YOUNG LAMAS DON WEIRD MASKS IN PREPARATION FOR A RELIGIOUS DANCE

Every lamasery has its own particular deities which it represents at the dances. A few are common to all centers where Tibetan Buddhism is practiced.



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A NASHI BOY IN TIBETAN DRESS

Traveling at high altitudes made members of the Expedition appreciate warm clothing. This black satin garment is fleece lined and trimmed with otter fur. The hat is made of a panda skin.



Natural Color Photographs by Joseph F. Rock
SOLDIERS OF THE MULI KING (SEE COLOR PLATE 1)

Their old, silver-trimmed, matchlock guns are of Tibetan make. Attached to each is a fork of antelope horn which serves the marksman as a rest to facilitate more accurate shooting.



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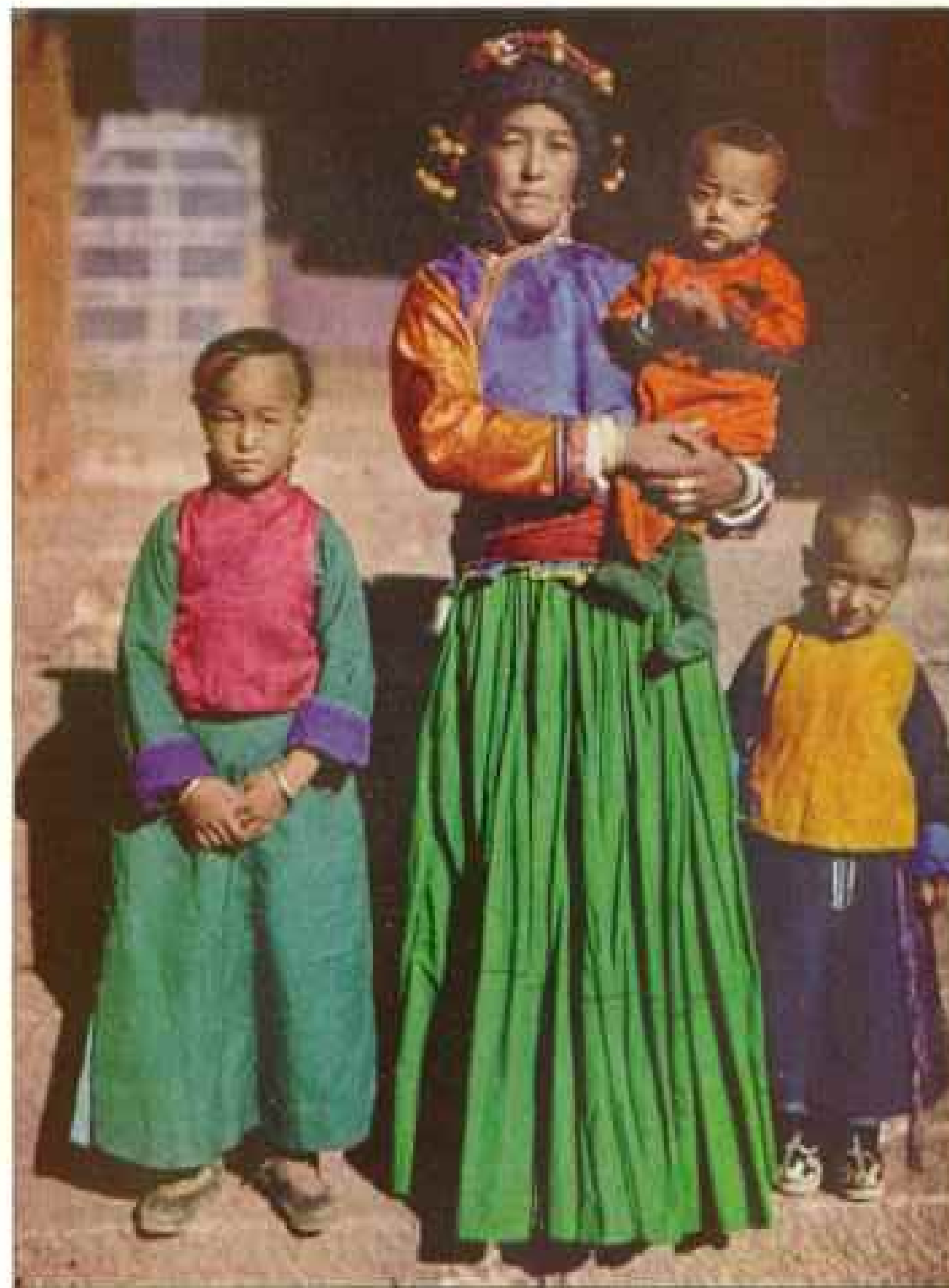
Natural Color Photographs by Joseph F. Rock

BRIGHT COLORS APPEAL STRONGLY TO THE HILIN HEART AND EYE

At the left two aristocratic young women are arrayed in their choicest finery (see Color Plate X). So precarious are conditions in their home city of Youngning that costumes and jewelry were kept on an island in Youngning Lake, for fear of raids by the Konkaling bandits. The mother and daughters at the right rate a bit lower in the social and financial scale.



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Natural Color Photographs by Joseph T. Rock

AN UNCROWNED KING AND HIS FAMILY

Hundreds of years ago the ancestors of this tribal leader were established as hereditary chieftains. He controls the Hlibin people of Youngning and lives on the islet of Nyorophu (see, also, Color Plate VIII).



© National Geographic Society
 IMPERSONATORS OF SHOWA FRIGHTEN PIOUS TIBETANS

Together with Yak and a gruesome retinue of living skeletons, he appears in many of the lama dances as a lieutenant of Yama, the King of Hell (see, also, Color Plates XI and XVI).



Natural Color Photographs by Joseph F. Rock
 HE HAS RISEN FROM THE RANKS

The commander of the Muli King's army is his brother-in-law. Originally a horseboy, he became palace cook and then worked on up to his present exalted position.



LAMAS MAKE THE DEMONS OF HELL SEEM VERY REAL

From left to right they represent the Yak, or Iron; Showa, the Deer; Yuma, the King of Hell, and Tsamethre, his wife (see, also, Color Plates XI, XV and XIX).



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Natural Color Photographs by Joseph F. Rock

A MULLI PRINCESS WITH HER LADIES IN WAITING

Sister of the King; she is a person of considerable importance in the land. The lady in waiting at her right is a Chungtien Tibetan; the one on her left a Koukaling Tibetan.

guide and magic provider, as well as I, were eager to penetrate to the mysterious peaks guarded by the Konkaling outlaws.

The cheerful indifference with which my Nashi men marched on, knowing of the danger we would have to incur, did not surprise me. They had been with me on an even more dangerous undertaking, when our goal was the sacred Amnyi Machen, in Ngolok land.

I owe much of the success of these expeditions to this intrepid mountain race. I could trust them implicitly. Not even in the greatest hour of danger, as when surrounded by 600 fierce Chinese bandits, did they show the white feather. And I recall other tests of their courage—in Kansu-Tebbu land, when we were attacked by a villainous mob; and again in a no-man's-land north of Sungpan, when they helped me disarm a band of 18 Tibetan ruffians who would have made short work of us had we been less swift than they (see, also, Color Plates V, XII, XXIII).

Now the Nashi boys were again to prove their mettle on this journey around the Konkaling peaks. Here the Muli head lama, now out of his element and no longer surrounded by spiritless serfs, became sore afraid and wished a thousand times he had not come.

Hours of toil and weary marching through the hot canyon brought us finally to a turbulent torrent, the Konka Chu, which had its source in the eastern glacier of Mount Chanadordje, the easternmost peak of the range. One more stiff climb up to a narrow rock ledge which served as trail, and we found ourselves at the Tibetan village of Garu.

THE GARU RESEMBLE APACHES

What a contrast greeted us here! The natives, proud and virile kinsmen of the Konkaling outlaws, walked about with an air of insolence and haughtiness which made our lama guide, who stood in fear and trembling of the Muli king, still more afraid.

The Garu people, tall and well-built men, fearless and open of countenance, resemble Apache Indians, with plaited hair hanging from each side of well-modeled heads. They were friendly, but not subservient. One took heart to be free at last of cringing serfs.

We pitched our tents near the house of the headman of Garu, and soon we were surrounded by a smiling group of stalwart tribesmen, every one of whom had killed his man. Here I received the visit of that wily individual, brother of Drashetsongpen, the bandit chief of Konkaling (see text, page 17). He sat on a rug in my tent, while the Garu people arranged themselves in a circle outside, my watchful Nashi men just behind them.

TREAT AND SCORN WIN SUPPORT OF ESCORT

My lama interpreter informed me that the Garu warriors were loath to accept the responsibility of escorting us around the sacred peaks. They explained that not even they themselves had dared to make pilgrimages for fear of the Konkaling outlaws. The Muli king had decreed that 20 of them should arm and escort me, they admitted; but they feared for my life. So, among themselves, they were debating the wisdom of our plans and putting every obstacle in my way to thwart my mission.

I found that quick action was necessary, else my plans would be frustrated. I rose, as if in contempt of their cowardice, and said: "Am I to be accompanied by Garu men or women?" and wrote a Chinese note addressed to the Muli king, in which, as I explained to the lama, I was informing his master that the lama and the Garu soldiers were afraid to escort me. Then I ordered him to secure a runner to carry my epistle to the king. This had the desired effect. Not another word was said about not going. Now, they agreed, they would protect me, even with their own lives!

Our guide betook himself to the monastery above Garu, whither I accompanied him. There he besought his gods to protect him from the bandits while circumambulating the sacred peaks. He gave half a dollar to a chanting priest to pay for prayers and burned some printed prayer-covered papers and juniper boughs to the deity protecting pilgrims.

I agreed not to take much baggage with me—only the most necessary supplies—so as not to tempt the Konkaling bandits. My head muleteer, who had listened to the debate around my tent, had become so scared that he vanished during the night and made his way down the river to Shendzong, with



WHERE PILGRIMS STOP FOR TEA FLAVORED WITH YAK BUTTER AND SALT

The Expedition camped here on its first visit around the mountain. The rock, at an elevation of 15,900 feet, is a huge block of schist which had evidently fallen from the lower slopes of Mount Jambayang. This picture was taken on the Expedition's second visit. In the foreground are some of the Nashi boys, with the lama official from Muli and a few Tibetans.

the idea of returning to Muli; but the Shu-hin people detained him, since no one can cross the bridge without permission of the lamas, took his sword from him, and held him for us.

A cold and rainy morning found us starting from Garu village. Each of the mounted Garu warriors was armed with rifle and *gawu* (portable reliquary shrine) to protect them against bullets! Curiously enough, here everyone carries both rifle and *gawu*, showing that, despite the alleged power of the shrine, they feel the gun might also be useful!

On leaving the monastery one enters a fine virgin forest which covers steep slopes to the high plateau of Konkaling. Denser and thicker became the forest as we marched on. Huge trunks of spruce and hemlock rose 150 feet, forming a dense canopy of lacy green, beneath which grew gorgeous yellow rhododendrons.

Soon we entered a region where progress was most difficult, for great fallen logs and trees lay helter-skelter over the mountain side, as if a cyclone had mowed the

giants down. Every few yards was a deep oval hole wherein a man could hide. These pits, I was told, together with trees which had been felled across the trail, were defense works made by the Garu to help repel the advances of the Konkaling bandits. It was difficult for me to believe that this quiet, beautiful forest could be also a battle ground.

At 14,000 feet we came to stands of fir forest and thick-leaved rhododendrons with pink and white flowers. Later these gave way to a forest of rhododendrons, and then to open scrub at an elevation of 15,050 feet.

"THE GODS ARE VICTORIOUS!"

Here we crossed a pass, where our lama and Tibetans yelled, "Lha rgellah! Lha rgellah!" (The gods are victorious!) Then they hastened to burn juniper twigs as an offering to the sacred mountain Chana-dordje, which we were then facing. But clouds enshrouded its hoary head.

Proceeding over a rocky trail, we halted on more gentle slopes, and then, at 15,300

feet, decided to pitch camp. I ascended the spur back of our camp to 16,320 feet, hoping to obtain a view of the other Konkaling peaks, but in vain. Looking east, however, the sky was clear, and more than 200 miles away rose two distinct snow ranges. There was one mighty peak that fairly pierced the sky. Not finding any in that direction on the maps, I then and there decided to spend the following year exploring those mighty snow peaks, and to clear up the mystery which hedged them in. The vast snow range I then beheld proved to be the unexplored Minya Konka.*

Evening settled over our high camp, I sat in front of my tent, facing the great mountain mass which the Konkaling Tibetans call Chanadordje. Presently the clouds shifted, revealing the glory of the Holder of the Thunderbolt—a truncated pyramid flanked by broad buttresses like the wings of some stupendous bat. Immense masses of hanging ice and snow extend to the very foot of the mountain, where they form huge moraines resembling a vast amphitheater. This the Konkaling people call Konka Djra-nse, the Sea Dragon's Snout. It is the source of the glacier stream Konka Chu (see map, page 7, and illustration, page 33).

CIRCUMAMBULATING THE SACRED PEAKS

To circumambulate these peaks and acquire merit, it is necessary to go from right

* See "The Glories of the Minya Konka," by Joseph F. Rock, in the NATIONAL GEOGRAPHIC MAGAZINE for October, 1930.



A WEALTHY HIHIN GIRL

She is a member of the Hihin chief's household, and her high station is indicated by her huge earrings and embroidered goatskin jacket with silver ornaments. On her forehead she wears a band studded with gold nuggets and above it coral and amber beads.

to left, this being the orthodox fashion of the Yellow sect. Our object, of course, was to make a photographic survey of this most peculiar mountain mass, which, unlike any other known to me, consists of three isolated peaks rising from a triangular plateau.

I wished, also, to collect botanical and zoological specimens, as this elevated region would certainly produce many novelties in those fields. Incidentally, in taking animal life on the high plateau, and especially around the peaks, we met immediately with opposition. The Konkaling people objected strongly to our killing birds. To me this seemed peculiar, for they them-



TWO KONKALING BEAUTIES OF THE TONYI CHIEF'S DISTRICT

These women were circumambulating the mountain and were persuaded to pose for their portraits. Their hair is greased and arranged in curls, which remain stiff around their faces. On their foreheads they wear large matrix turquoises.

selves do not hesitate to kill a pious pilgrim while both they and the pilgrim are devoutly circumambulating the sacred peaks! We did not strictly heed the suggestion of our escort, but made our collections of animals out of its sight.

Our Muli lama was still afraid of the bandits, and tried to divert my caravan from the path we had agreed on. He hoped that if he could lead me to a point where we could obtain a view of the sacred peaks without the trouble of patiently walking around them, I would give up all idea of making the regular pilgrimage, and thus enable him to return as quickly as possible to safer ground. But when he informed

me that the caravan had gone north instead of west, I ordered him to overtake it at once and to bring it to the spot agreed upon, Shingara, near the snout of Chanadordje Glacier.

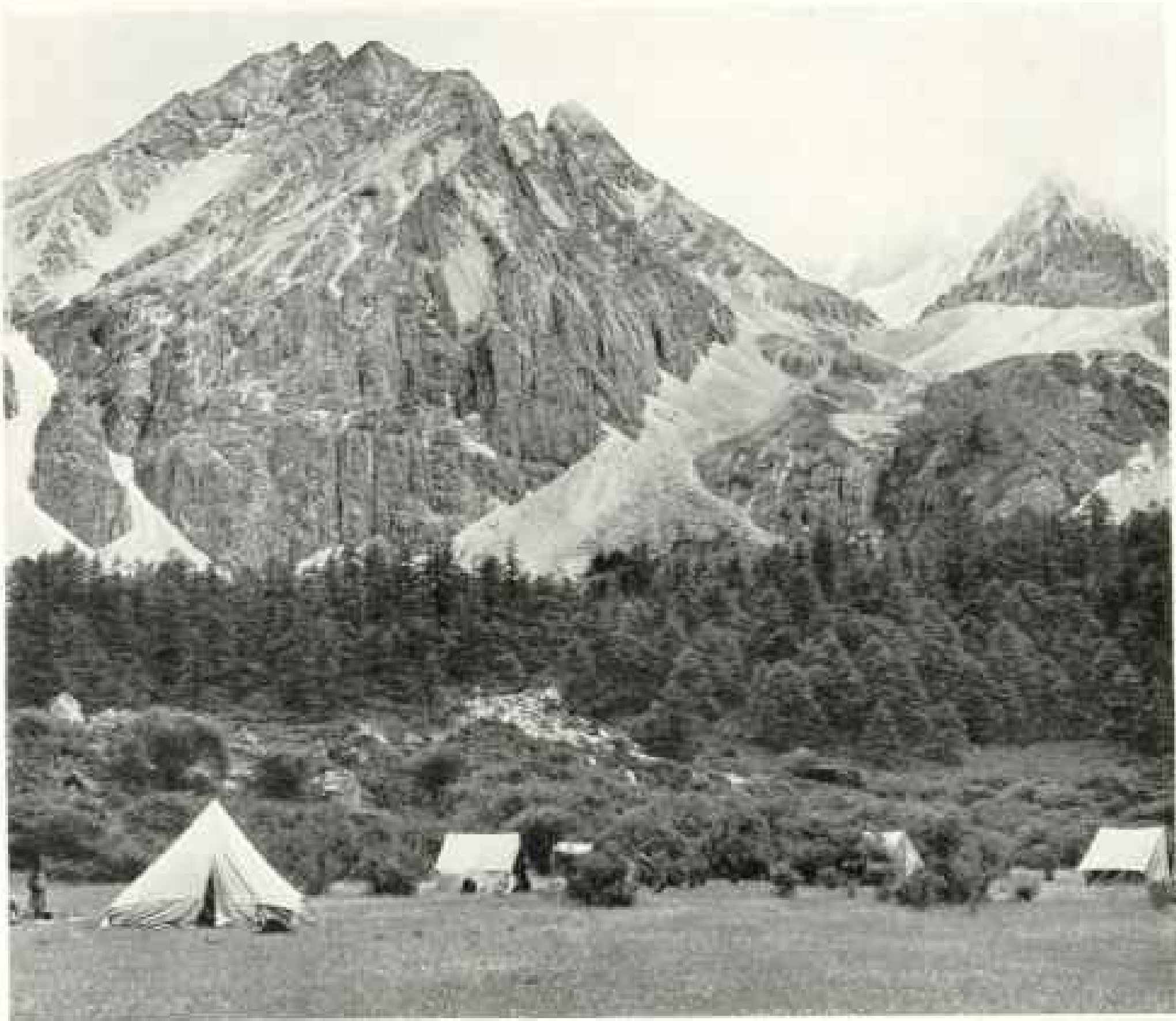
So, late in the evening, my men and supplies finally arrived at Shingara, after having twice crossed 17,000-foot passes. Shingara, as well as the eastern face of Chanadordje, is still nominally in Muli territory; but no one hailing from Muli would dare pasture yaks on its alpine meadows because of the Konkaling outlaws.

The following day we explored the head of the Shingara Valley and its glaciers, while the caravan patiently made its way up the steep, forested slopes to the southwest of Chanadordje. It halted for lunch in Saiyo Katso, a valley which, though 15,200 feet above the sea, stands at the foot of two pyramidal peaks named after the Tibetan God of Wealth, Dzambala.

Up Shingara, where we shot some snow pigeons, we found two Konkaling Tibetans hiding among the trees. After they had been observed, they stepped forth and called; whereupon several women crawled from behind huge boulders in the stream bed. Any shots heard hereabouts are always supposed to have been spent on sending some individual into the spirit world, since no one wastes shot and powder on useless pigeons, as we had done.

AN ARDUOUS TRIP FOR THE MULES

Our journey around the peaks proved very arduous. We crossed the Yaka Pass under torrential downpours. There was no



CAMPED AT THE FOOT OF MOUNT CHANADORDJE

The summit is hidden in the clouds. The trees are mainly larches and firs, the shrubs chiefly willows.

trail, and the ground was littered with slabs of schists over which the water rushed in torrents, depositing everywhere a slippery gray mud, which meant torture for the loaded mules at an altitude of 16,300 feet. In the eyes of pilgrims, we most certainly should have acquired much merit, for the weather god could hardly have sent worse weather—or better—as the case may be, depending on the religious viewpoint.

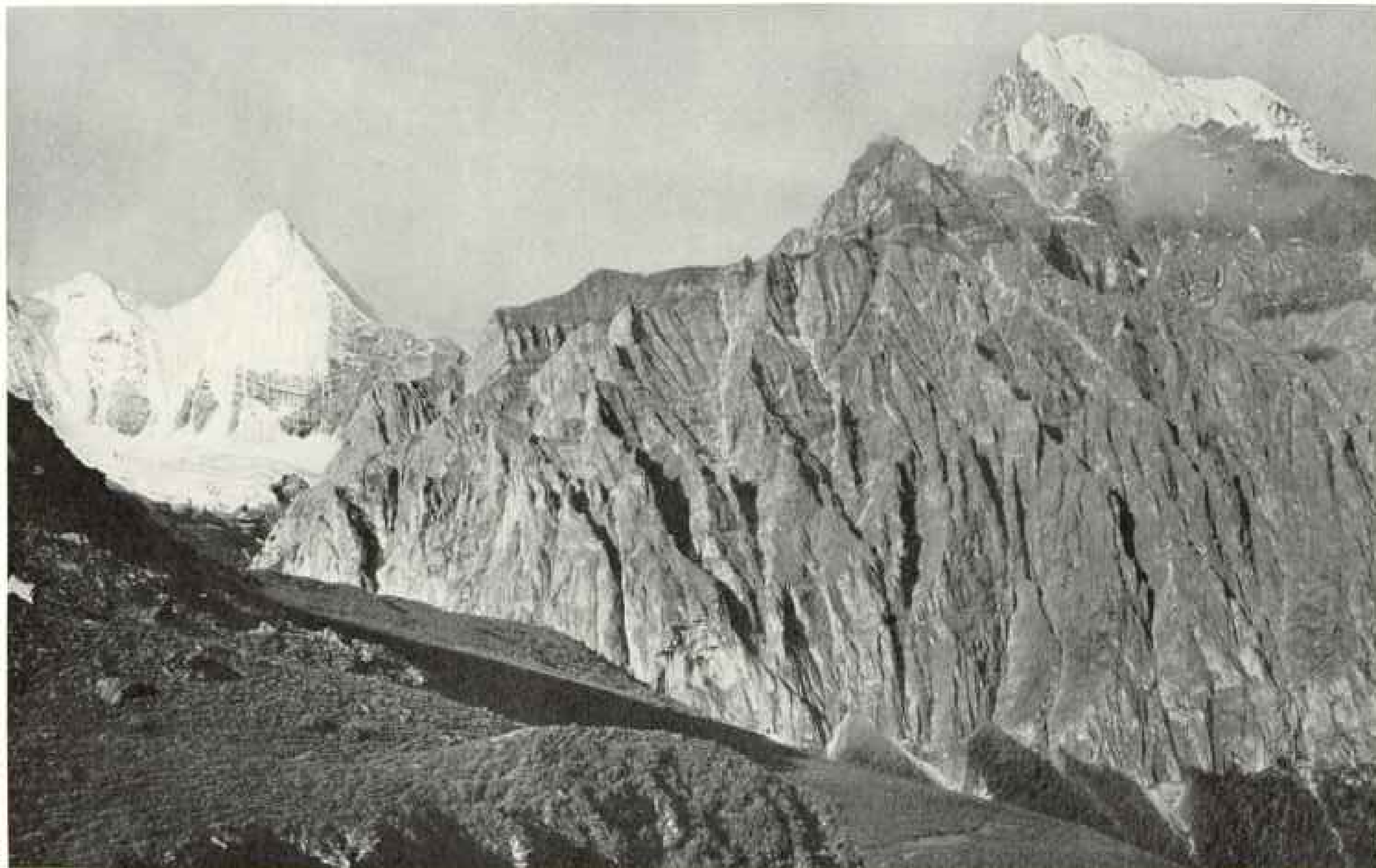
That night we spent on the southeastern slopes of Mount Jambeyang, highest of the Konkaling peaks, rising to an elevation of more than 20,000 feet. Shenrezig and Chanadordje are each about 20,000 feet in height (see Color Plate XVII).

On Yaka Pass wonderful primroses formed large round cushions, their roots embedded in cracks between boulders, the leaves small and glossy. They were almost completely hidden by brilliant wine-colored

flowers. Other cushion plants vied with these, such as forget-me-nots of the richest sky-blue. Other primroses stood in rows upon rock shelves, their purple flowers nodding in the wind and rain.

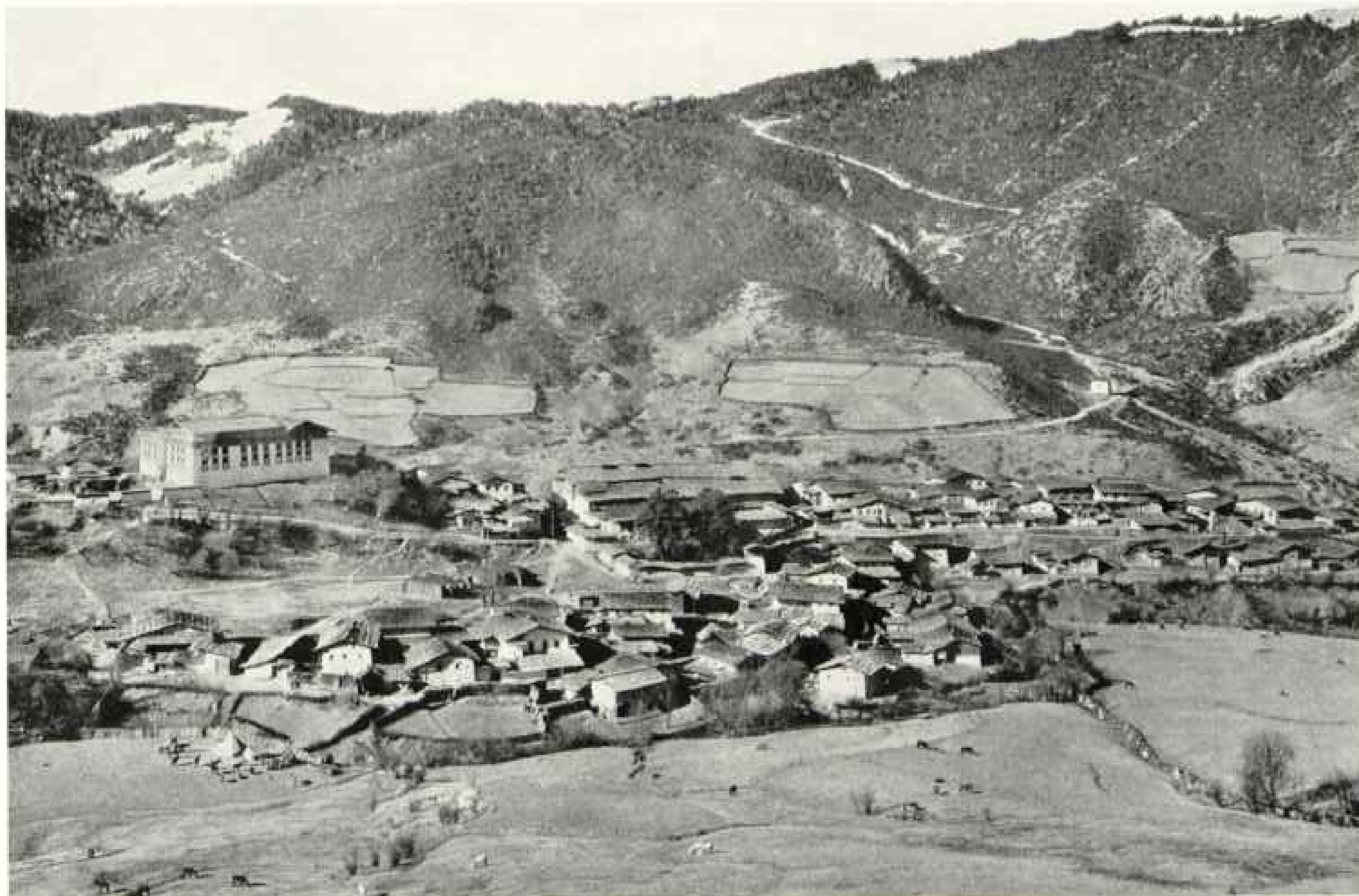
The mules, climbing over the rocky pass, which resembled a stairway with giant steps, fared badly and had to be helped bodily over the boulders. Climbing at such altitudes is difficult enough in good weather, but in a terrific hail and rain storm, with a howling gale driving the icy pellets into one's face and making one gasp for breath in this rarefied atmosphere, it is doubly disagreeable.

A stream, its accumulated waters rushing from the rocks around us, gushed madly over the trail, past a peak with a truncated apex resembling a cenotaph. This was Tuparu, symbolizing another mountain deity.



THE TWO HIGHEST PEAKS OF KONKA RISUMGONGRA

The left pyramid is Mount Jambayang, the peak at the right Mount Shenrezig. In the deep Duron Valley, between Jambayang and Shenrezig, the Expedition camped on its second trip to the Konkaling (see illustration, page 65). This photograph was taken from the author's camp, Bayu, at an elevation of 15,800 feet. An immense glacier can be seen at the foot of Mount Jambayang.



THE LAMASERY OF KULU, THE SECOND LARGEST MONASTERY IN THE MULI KINGDOM

It is situated in a valley three days' journey east of Muli, at an elevation of 12,400 feet. The Muli king's palace is to the left on a hill. The long buildings in the center are chanting halls.

That night we camped on the southern slopes of Mount Jambeyang, at the foot of moraines and hanging glaciers, in an alpine meadow covered with a multitude of flowers. Giant rhubarbs grew on the edge of the moraine. Our escort and lama guide occupied a cavelike shelter under an overhanging cliff, part of the buttresses of mighty Jambeyang. Here pilgrims or lamas had erected *chortens*, or reliquary shrines, which rose to the rocky vault; a rock balustrade encircled the long cavern which serves pilgrims as well as bandits for shelter and place of attack (see p. 60).

The stillness of the cold night at the high elevation of our camp was often disturbed by the thundering noise of falling blocks of ice, dropping and sliding from the heights above.

AN INTERVIEW WITH THE BANDIT CHIEF

Near this shelter, on our second trip around the peaks (see text, page 64), we encountered Drashetsongpen, the bandit chief. He was circumambulating the sacred peaks, perhaps in expiation of his heinous crimes or in contemplation of new predatory ventures. His entourage was composed of the scum of outlaws, their sullen faces hinting at loot and murder.

The leader politely uncovered his head, bowed, and motioned for me to sit on a rock. Then he ordered an underling to untie a saddlebag of yak hide, from the recesses of which he took large chunks of much-fingered yak butter and loaves of a sort of cottage cheese. It rained in torrents while this took place, which prevented me from taking pictures of him and his thirty outlaws, all armed with rifles and pistols looted from Chinese soldiers in the north.

He asked me where we intended to camp that night. As I hesitated to reply, he placed his hand upon his chest and said: "You will have nothing to fear, for I have given orders that you shall remain unmolested." This ended our interview.

Soon we ran into a wapiti at the foot of terrific cliffs. My hunter aimed and fired, the bullet finding its mark; but the animal rolled probably 2,000 feet, down to the bottom of Lawatong Valley.

Our trail now led to another pass, 16,500 feet in height, and up a most peculiar valley, Yetchetsura, on the slopes of Mount Jambeyang (see map, page 7). Rocks

here were of an entirely different nature, being composed of enormous slabs as smooth as a billiard table, the entire valley slope resembling a huge macadam road. Giant blocks the size of a small house, composed of many layers of such slabs, had fallen from the heights and lined the trail, which was still covered in places with large patches of snow and ice. A rainstorm made traveling very disagreeable, and as the day was waning we were chilled to the bone.

THE MOST DANGEROUS PART OF THE JOURNEY

We camped that night at 16,200-foot elevation, in Tonyi Besi territory, where dwell the worst of all the Konkaling outlaws. In this region are several lakes. The largest, Rüssu Tso, is at 15,500-foot elevation. The glaciers of Jambeyang feed the lake from vast hanging fields of ice. This is considered the most dangerous part of the journey around the sacred peaks.

Our lama guide, who carried one of my rifles, looked anxiously about, then tremblingly handed the gun to my headman. High on the slopes, under a rocky shelter opposite the lake, we espied several Tibetans behind rocky parapets. They commanded the entire lake valley and could have kept us from moving forward. Whether they were bandits or pilgrims we never learned. They remained behind their rocky ramparts and watched as we laboriously climbed to another pass, a level alpine meadow with valleys radiating in various directions.

A long valley, Konka Den, descends east from here, between Jambeyang and Shenrezig, and on another journey we explored and camped in it.

That night we were to reach a tiny monastery called Tsengu Gomba, at the foot of Mount Shenrezig, facing the glaciers and a lovely stream hemmed in by larches, firs, and spruces. To reach it, another terrible pass of 16,200 feet had to be scaled, the trail leading in sharp zigzags to a rocky crest and thence steeply down Bonquende Valley. To our left, in a terrific gorge far below, flowed the Ren Chu. It encircles the Konkaling plateau and flows in a northeasterly direction into the Shou Chu River.

We had expected to find Tsengu Gomba on the other side of the pass, but were disappointed. On we went in torrential rains,

WITH THE DEVIL DANCERS OF CHINA AND TIBET



MOUNT JAMBEYANG TAKES ITS NAME FROM THE GOD OF LEARNING. The deity is supposed to make his home within this mountain, which is one of the three peaks of the Konka Risungongba (see, also, Color Plate IX).



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Natural Color Photographs by Joseph F. Rock

PAUSING FOR A REST 17,000 FEET ABOVE THE SEA

The Expedition's escort at this stage of the journey through the Konka Risungongba was composed for the most part of Tibetans from Muli, and Konkaling outlaws. Piles of rock in the background are offerings erected by pilgrims. The man in red is a lama, secretary to the Muli King (see Color Plate I).



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LOOKING ACROSS YOUNGNING LAKE TO THE MOUNTAINS OF SZECHWAN

Natural Color Photograph by Joseph F. Rock



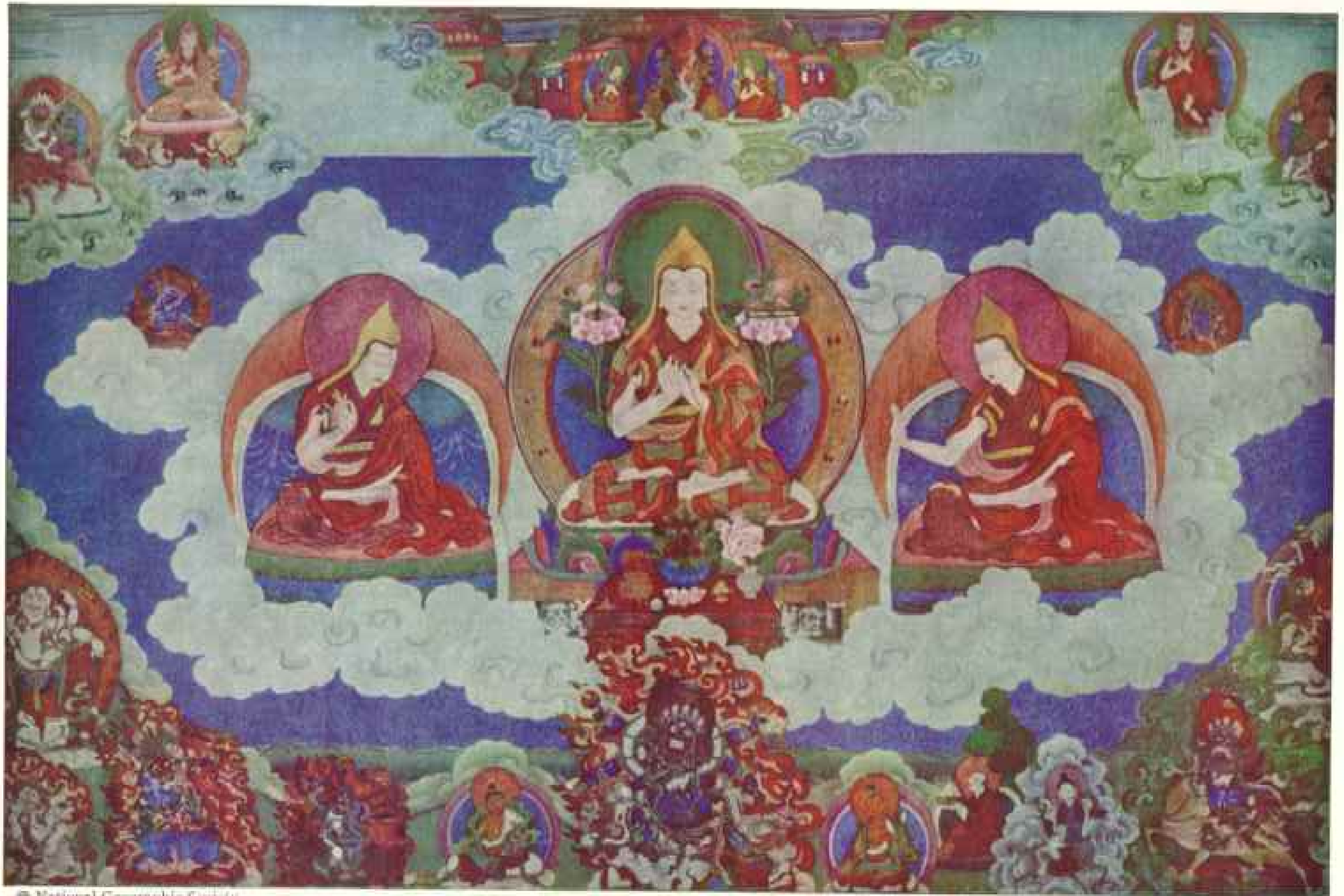
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A TIBETAN CONCEPTION OF THE QUEEN OF HELL.

She plays a prominent part in nearly all lama dances, both in and out of Tibet, and is usually portrayed with a scepter and coronet of skulls.



Natural Color Photographs by Joseph P. Rock
HE COMMEMORATES A DEED OF VIOLENCE

Sorcerer's dance with spirit daggers in hand to celebrate the assassination of an ancient royal persecutor of Buddhism. Youngtong Monastery.



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INTO GORGEOUS TEMPLE BANNERS IS WOVEN THE RELIGIOUS HISTORY OF TIBET

Here Tsongkhapa, founder of the Yellow reformed sect of lamas, is seen with a favorite disciple on each side. Above, to the left and right, are his four manifestations: Some of the lamaseries are ablaze with the brilliant colors of numerous banners.



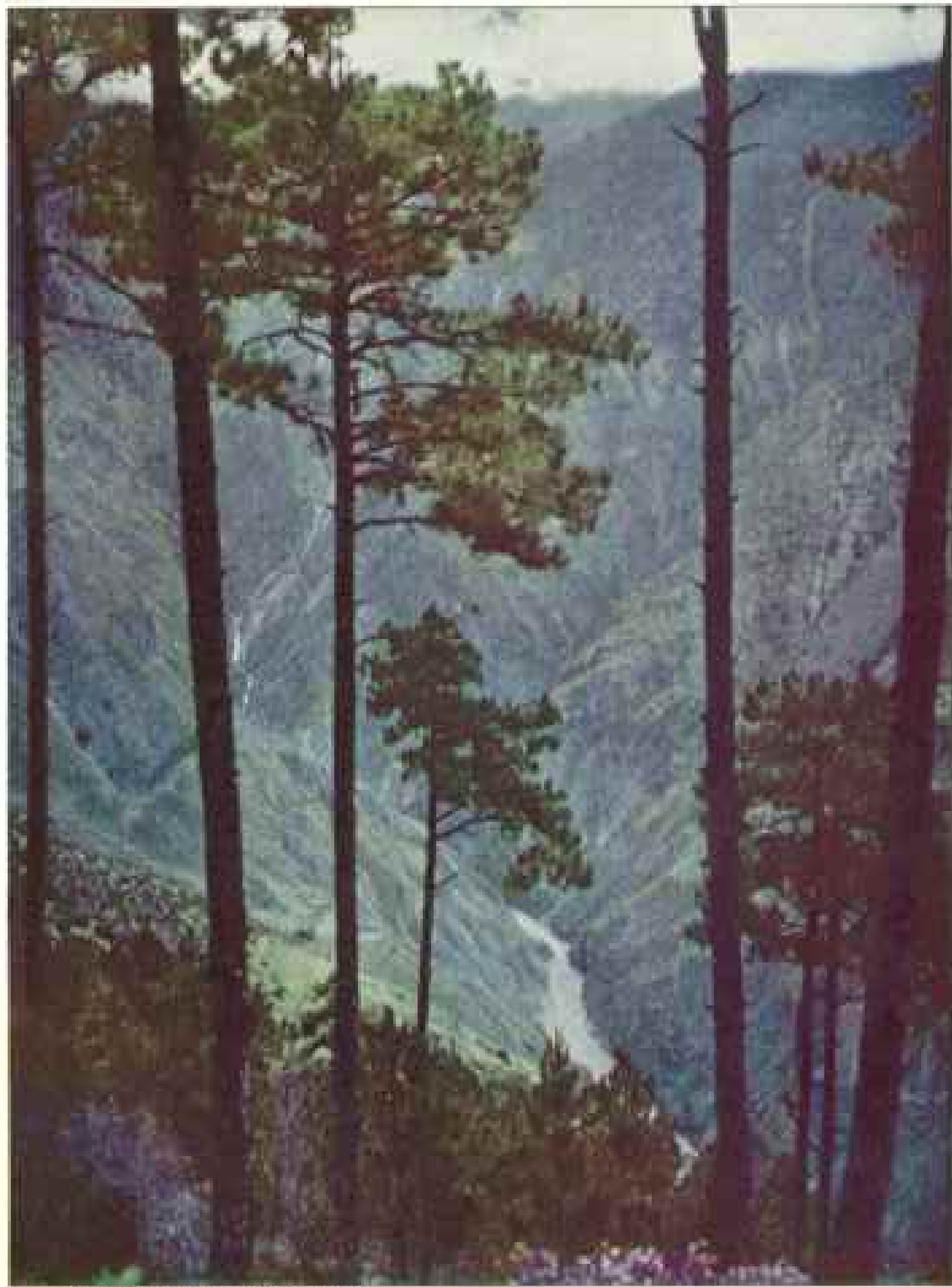
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LAMAS IMPERSONATE SPIRITS OF GOOD AND EVIL.

The man at the left represents a tutelary deity of the White lama sect at Youngting. He holds a drum in one hand and in the other a human thigh bone. At the right is an impersonation of the Yak Demon, whom Tibetans regard as one of the King of Hell's first assistants (see Color Plate XVI), La-Kang Ting Monastery.



© National Geographic Society
THE GORGE OF THE SHOU CHU, BETWEEN GARU AND DZERU
VILLAGES IN MULI TERRITORY



Natural Color Photographs by Joseph F. Rock
A NATIONAL GEOGRAPHIC SOCIETY EXPEDITION CAMP,
HIGH IN THE FORESTED MOUNTAINS OF MULI



© National Geographic Society



Natural Color Photographs by Joseph F. Rock

BUTANIST AND ORNITHOLOGIST FIND RARE TREASURES AMID THE VAST RANGES OF INTERIOR CHINA

Dr. Rock has brought back to America wonderful collections of plants and bird skins from this hitherto almost unexplored region of snow peaks, glaciers, and forests. The two species of primrose at the left grow in spruce and fir forests on the slopes of the Konkaling peaks, at a 14,000-foot altitude. At the right, one of the Expedition's Nashi assistants has captured a fine specimen of the Amberst pheasant in northwest Yunnan.



ROYALTY RESIDES HERE ON OCCASION

The ruler of Muli (see, also, Color Plate I) maintains this palace near the La Kang Ting Monastery. Window glass is conspicuous by its absence, while heat and light come from pine fagots. Flint and steel have not yet been superseded by matches.



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Natural Color Photographs by Joseph P. Kock

THE MULI KING AND HIS RETINUE

At the seated monarch's left is the Menkong, highest lama official of the kingdom, who acts for the ruler in his absence. The party is in front of a group of sacrificial chimneys opposite the king's Kuli palace.

soaked to the skin, our hands numb and our shoes full of water, until we struck juniper forests and the roaring glacier stream of Shenrezig, whose eternally snow-crowned peak was hidden in mist and clouds.

We reached a larch forest. The trees were heavy-stemmed and thick-set, but not tall. At the foot of the rocky valley wall opposite nestled a deep-blue lake, Dutsu Kwa, or Shenrezig's Cup. After an arduous, cold, wet march, we reached Tsengu Gomba, a small and dilapidated monastery situated at the comparatively low altitude of 14,120 feet, on a spur near the junction of Bonquende and Shindze rivers.

We were ushered into one of the stone buildings, black and dingy, word having been sent by Drashetsongpen to take us in and extend such hospitality as the place afforded. The caravan unloaded in the tiny courtyard in pouring rain, while we entered the old building through a dark, narrow corridor. On both sides opened small, dingy, smoke-filled rooms, in which Tibetans were cooking over damp wood fires.

TAKING SHELTER IN A BANDIT MONASTERY

I was led over a steep stairway to the left, into a fairly good room—for that part of the world. It was the best the monastery could afford and was evidently the quarters of a Living Buddha. The ceiling and walls were painted, and at the head of the room was a throne and bed, above which hung some Tibetan scrolls representing Tsongkapa, the founder of the Yellow sect (see, also, Color Plate XX).

To my left a door led into a tiny private chapel, wherein reposed the tutelary demon of the Buddha. From below juniper incense seeped through my glassless and paperless window and through every crack and crevice in the floor.

Since no white man had ever visited this weird spot, or any foreigner ever circumambulated these sacred peaks, a crowd of Tibetan bandit pilgrims, queer-looking men and women, had come to watch our arrival. They had climbed over the wall and stared at me, while others had filled the courtyard to see this strange spectacle—the arrival of the first white man the roof of this monastery ever sheltered. Their curiosity satisfied, they continued their pilgrimage, continually walking around the old monastery from right to left, chanting in unison.

I felt buried in these mountain fastnesses, icebound on all sides. The monastery was the rendezvous of all the outlaws and bandits and perhaps some occasional genuine pilgrim of the surrounding no-man's-land. My lama guide tried to persuade me not to stay longer than a day and wanted to move on the next morning, but I demurred. Had I not come to photograph and map the sacred peaks, to collect the flora and fauna of this unknown region?

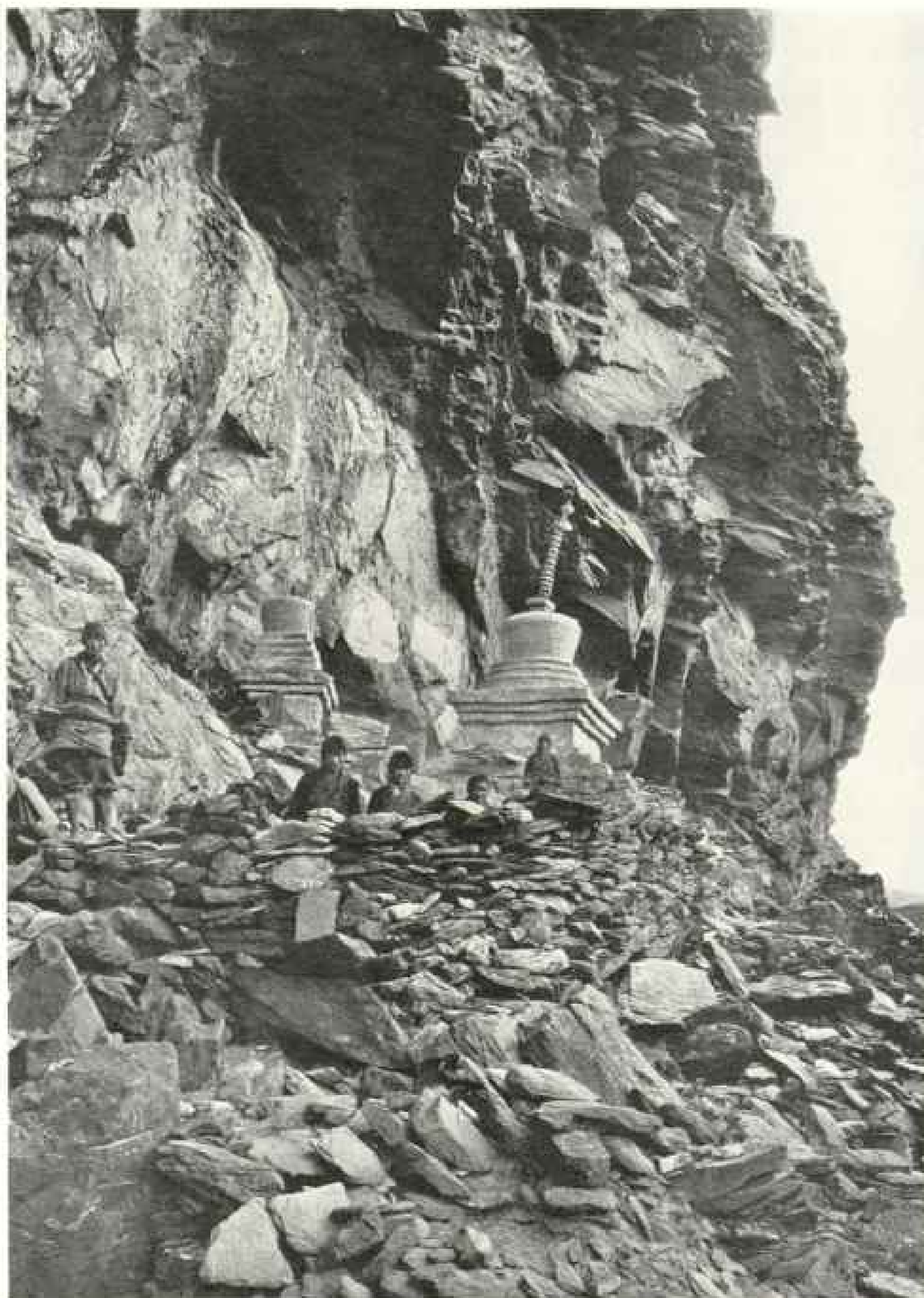
SHENREZIG RESEMBLES A HUGE WHITE THRONE

I stayed three days. The morning after our arrival the sun shone gloriously and I managed to obtain some fine photographs of Shenrezig. The peak resembles a huge white throne, such as Living Buddhas use when meditating—a worthy seat for a Tibetan deity! A magnificent view could be had of the peak and its huge glacier from my room.

Intent on finding a spot whence peak, glacier, and stream could be photographed to advantage, I left the monastery alone. I had not been gone long when my bandit escort became aware of my absence and rushed forth to find me. They ran to me, when they saw me all alone up the valley in the stream bed, and surrounded me, all armed with loaded rifles. They warned me never to go out alone again, for it was taking one's life into one's hands. I laughed and followed them back to the shelter of the old monastery roof.

Great forests cover the spur and valley in which Tsengu Gomba is situated; but I noticed a spot not far from the monastery where the trees had been felled. Being astonished at such vandalism perpetrated near a shrine, I inquired who was responsible for this destruction. The lamas told me that the year before avalanches had descended from Shenrezig and overwhelmed the trees. They added that whenever this happens invariably the lamasery is looted by bandit pilgrims.

The lamas were ignorant as to the age of the monastery, but said it must be well over a hundred years old, for this was the third generation of their Living Buddha. With my lama guide I visited the monastery, armed with silver half dollars, which I distributed as gifts among the monks. The main building contained four temple rooms, one housing an obscene, many-



A CAVE ON THE SOUTHERN SLOPES OF MOUNT JAMBEYANG.

The spot is frequented by Tibetan pilgrims, who circumambulate the mountain, as well as by highway robbers, who also may be on pilgrimage at the same time. The structures are *chortens*, or reliquary shrines (see, also, text, page 50).

armed image. Outside, tied to posts, were all kinds of offerings, left there by perambulating pilgrims — bracelets, rings, beads, feathers, bells — even hairs. There was nothing beautiful whatever, only filth and evil smells. The few praying lamas were dressed in rags shiny from yak butter, for their robes serve as towels as well as handkerchiefs.

A CONSTANT STREAM OF RANDIT PILGRIMS

Next to my quarters stood a small square building containing a large prayer wheel and a fresco portraying the trinity, Risumgongba. An ever-moving stream of evil-looking pilgrims entered the little house, gave the prayer cylinder a complete turn, and then moved on, continuously circumambulating the old and, to them, sacred buildings.

Tsengu Gomba is a combination of monastery and nunnery, for here are housed both monks and nuns, even in the same room. The nuns were lean and lanky old creatures, six feet or even taller, and wore high Tibetan boots. Their mouths were toothless, their heads shaven, and trousers covered their limbs. Only when they spoke was it possible to distinguish them from men.

My nights here were most disagreeable. The smoke from the open fires in the center of the rooms below found its way into my quarters and made my eyes smart; my nose and throat were irritated by ammonia-like odors from the surrounding stables, which are never cleaned. I decided to leave sooner than I had expected, much to the



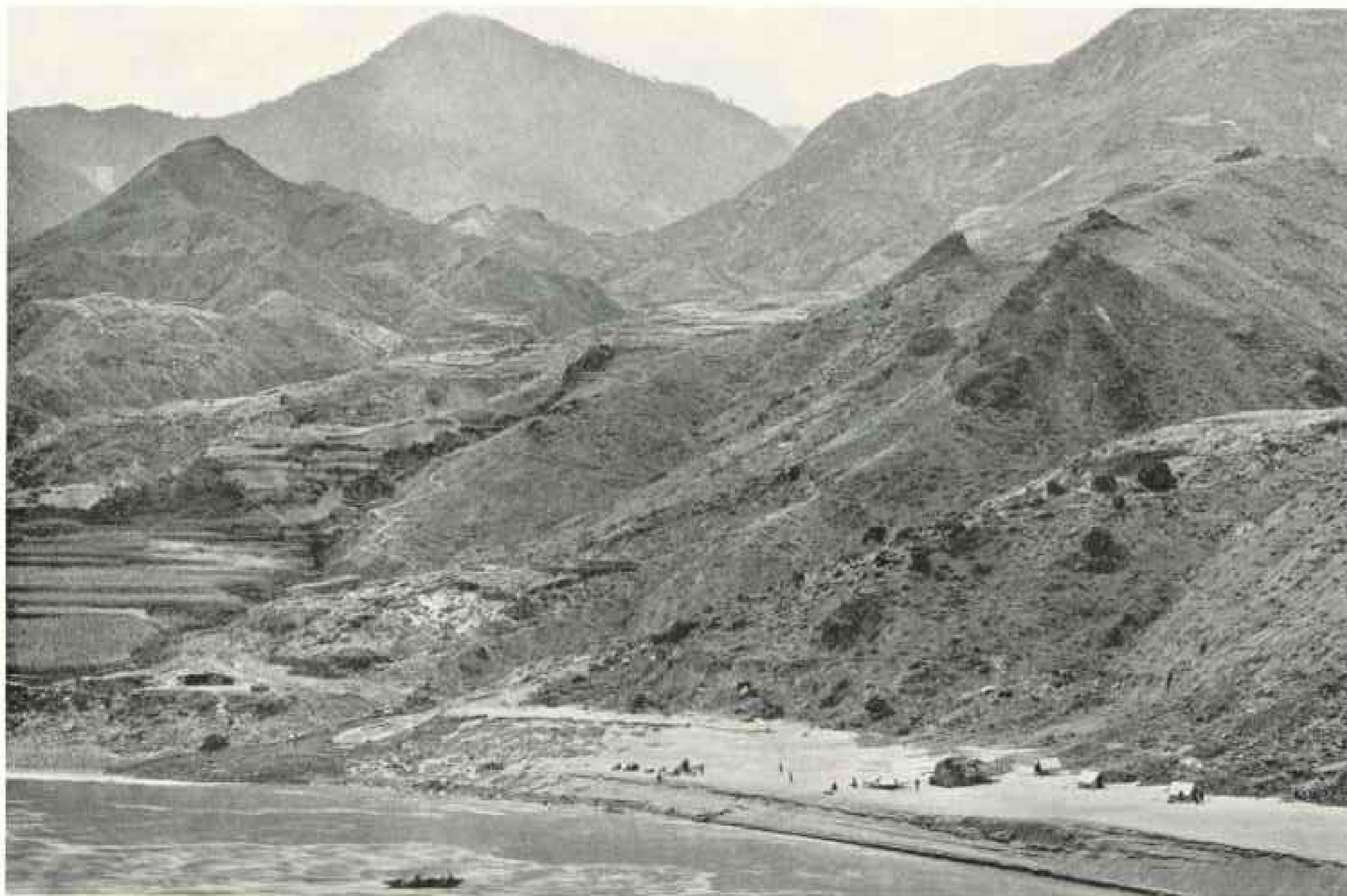
A MEMBER OF THE AUTHOR'S ESCORT ON THE SECOND KONKALING EXPEDITION

He is a Hsifan, or Chrame, from Kulu, and wears the skins of blue sheep which roam the mountains of the Konka system.

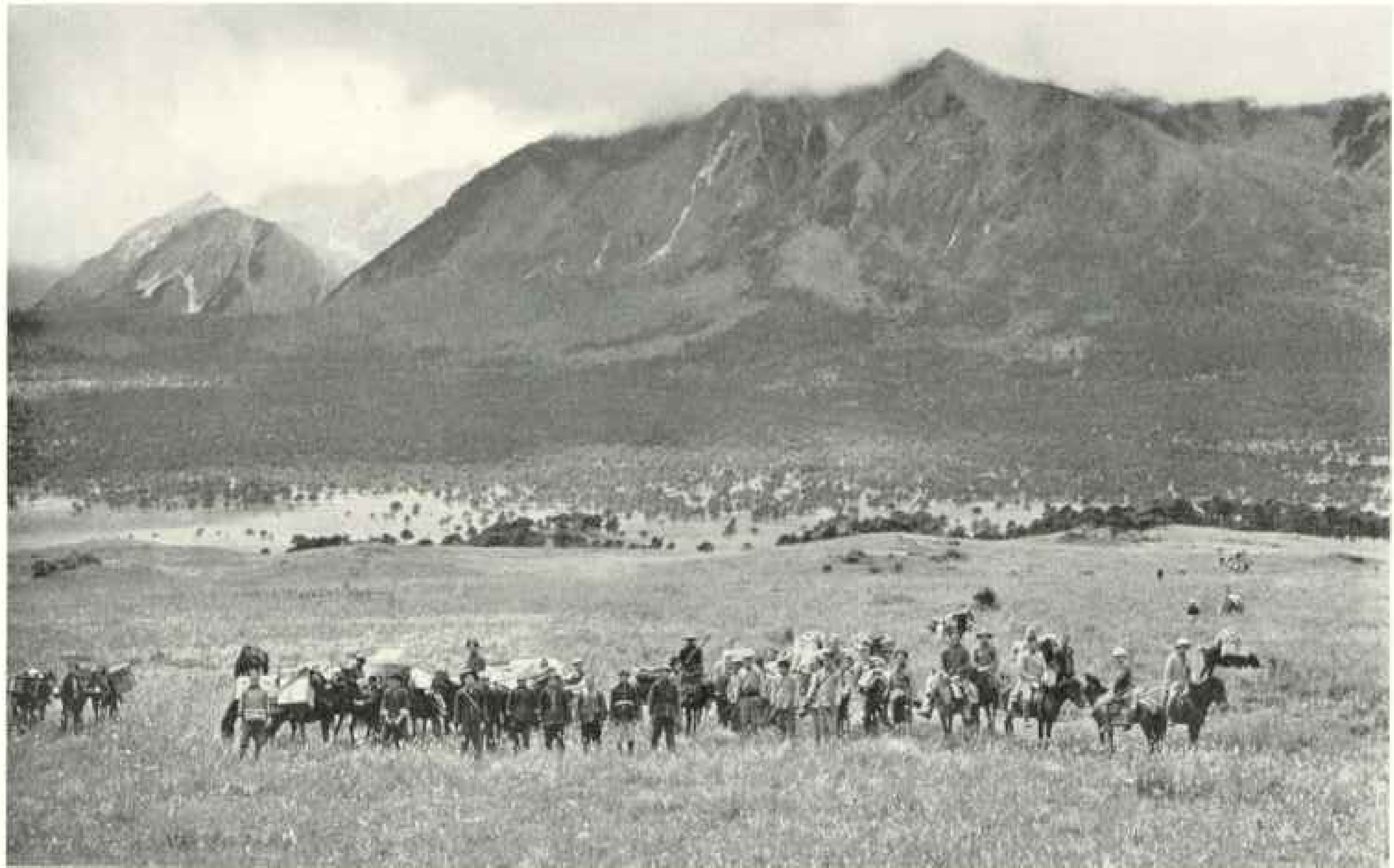
delight of my lama guide, who felt the responsibility of his charge most heavily.

PEERLESS JAMBAYANG

We left on the final lap for a pass up Shindze Valley. There we camped at 15,800 feet, where we could view both Jambayang and Shenrezig to the best advantage should weather conditions permit. We spent two nights at this high camp, called Bayu. The second morning, with a temperature of 40° Fahrenheit, on June 26, my lama awakened me at 4:30 a. m., calling into my tent, "Behold the glory of Jambayang and Sheurezig—your luck indeed is great!"



THE EXPEDITION'S CAMP ON THE YANGTZE AT FUNKOU, AS SEEN FROM THE EASTERN BANK, IN YOUNGNING TERRITORY
It took one and a half days to ferry all animals, loads, and men across the river at this point. The elevation of the camp was 5,600 feet.



THE CARAVAN OF 36 MULES, 9 HORSES, AND 29 MEN, WITH AN ESCORT OF 10 HLIHIN SOLDIERS

The escort is accompanying the author's party on its return from the Konkaling journey by way of Youngning. This is the plain of Gaba, on the eastern slopes of the Likiang snow range, north of Ngulukö (see map, page 7).



A GIANT RHUBARB AT THE FOOT OF MOUNT JAMBELYANG

I rose and stepped into the cold, gray morn. In a cloudless sky before me rose the peerless pyramid of Jambeyang, the finest mountain my eyes ever beheld. The sky was greenish black. The snowy pyramid was gray, but the apexes of both it and Shenrezig suddenly turned a golden yellow, as the sun's rays kissed them.

Long after Shenrezig was hidden in clouds, the glory of Jambeyang remained in full view and brought back to mind my last glimpse of the sacred peaks of the Annyi Machen from Shachü Yimkar.

On my second journey around the Konkaling peaks, in August, we experienced even worse weather. The summer monsoon had descended in full force and made traveling still more difficult. It also pre-

vented me from securing better photographs of Mount Chanadordje, for it persistently refused to unveil its hoary head.

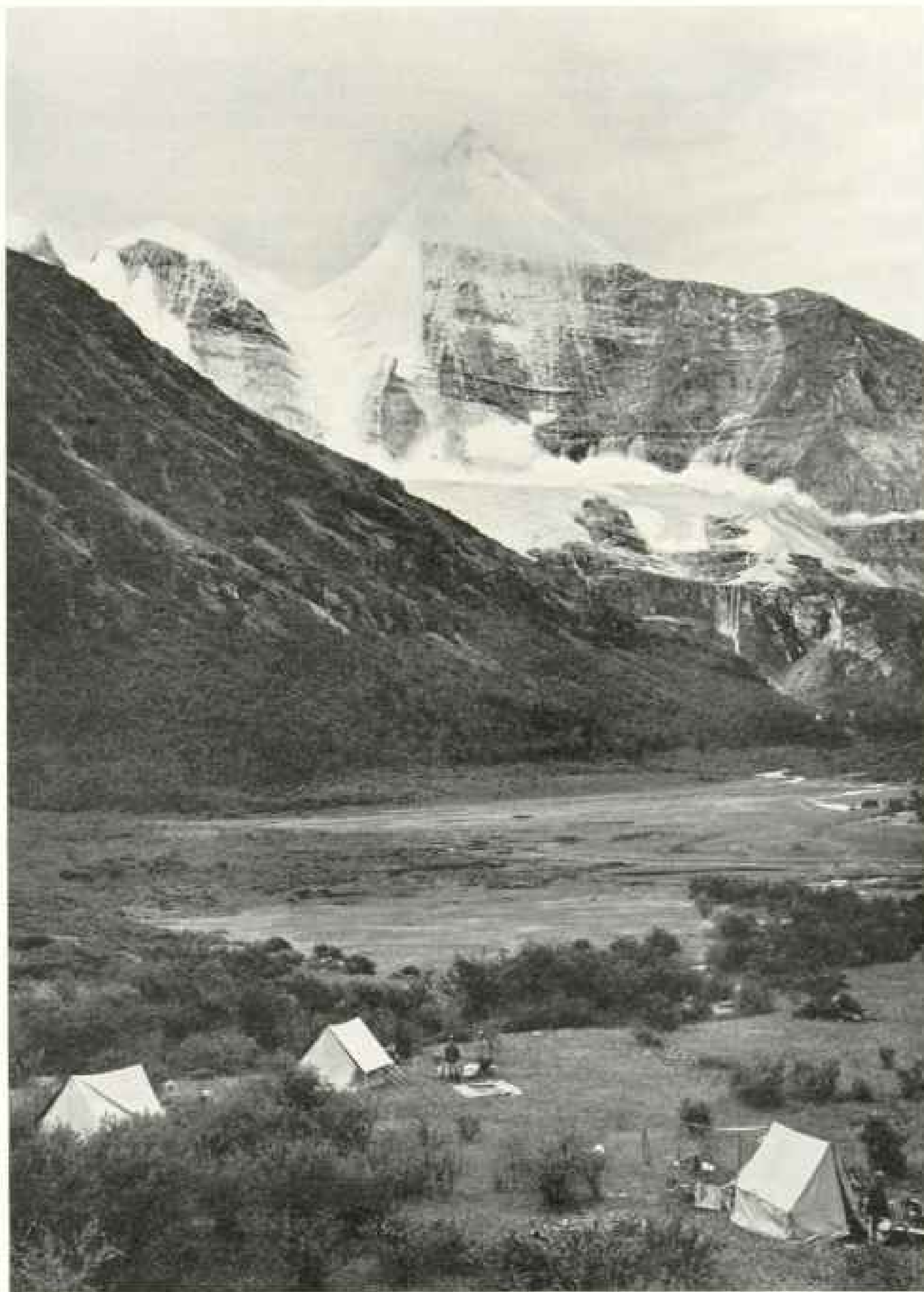
Later in 1928 I had intended again to visit the Konkaling peaks and once more tried to engage the Muli king's help. This time he was a bit uneasy. Rumor had it in Kulu Monastery that Drashetsongpen had sent a letter regarding us. The king at the time stoutly denied having received such a letter and gave me permission to go to the Konkaling plateau.

MOUNTAIN GODS ANGRY

All arrangements for my third visit had apparently been made by him. He had detailed a lama to accompany us. I started, going from Kulu to Djago, where the king's sister and her husband lived (see Color Plate XVI). But early the next morning a runner arrived with a letter

from the king inclosing one received by him from Drashetsongpen. My royal friend begged me to desist, for the robber chief said he had heard of our presence in Muli, and should we again visit his territory he would not listen to the king this time, but would rob and murder us.

His reason was the obvious displeasure of the gods. Shortly after our last trip around the peaks the wrath of the deities was aroused and hailstones descended in such size and quantity as to destroy the entire barley crop of the Tonyi Besi outlaws. Knowing their cruelty and determination, we took the hint, and thus the land of the Konkaling outlaws is again closed and their mountains remain guarded as of yore.



THE EXPEDITION'S CAMP IN THE DURON VALLEY, AT AN ELEVATION OF 14,700 FEET, WITH MOUNT JAMBELYANG IN THE BACKGROUND

This photograph also shows the glacier of Jambeyang, with its waterfalls. The trees are spruces, firs, and larches, and, farther up the valley, tall junipers. The shrubs in the foreground are willows (see, also, illustration, page 48).

THE MOST FAMOUS BATTLE FIELD IN AMERICA

THE Battle Field of Gettysburg! What stirring memories are borne on every breeze that blows over its hills and through its ravines!

Here, during the first three days of July, 1863, the course of American history, if not indeed the trend of world destiny, trembled in the balance. Here American courage and valor reached a high-water mark; here the hopes of the Confederacy attained their flood stage and began the ebb that ended at Appomattox.

As we motor along the avenues that mark the battle lines, now pause in reverence before this and that monument erected on the field; now visit the earthworks of a famous corps, division, or brigade; now climb one or another of the five steel observation towers for a broader sweep of the terrain, we understand why this is the most widely known of all the battle fields of America, attracting more than 800,000 visitors annually.

MEADE AND LEE BOTH AT DISADVANTAGE

Never did any commander face his problem under greater difficulty than did Gen. George Gordon Meade. At 3 o'clock on the morning of June 28, less than 80 hours before the great battle opened, he was awakened in his tent at the headquarters of the Fifth Corps, which he had been commanding. An officer from Washington announced that he had come bringing trouble. Later, in a letter to his wife, Meade confessed that he thought the officer had come to relieve him of his command or to arrest him; but his conscience was clear.

And trouble it was that the officer brought, though of a vastly different kind. He delivered an order from the War Department directing General Meade to take command of the Army of the Potomac, concentrate its scattered forces, break the hold of the Army of Northern Virginia on the Susquehanna, protect Baltimore and Washington, bring the invaders to battle, and cause them to retreat to their own soil.

General Lee, too, was in straits. Stuart's dash around Hooker's army had deprived the Southern leader of the only eyes an army could have before dirigibles and airplanes came into being.

In those last three days of June both commanders were at a disadvantage—Meade because he had had thrust upon him a Herculean task and must get his hands

on the reins, and Lee because his cavalry was beyond his reach.

Few visitors who go to Gettysburg realize that there were two battle fields in that historic struggle. The battle of the first day was fought to the north and west of the town. Not a single Federal soldier was left on that field when the fight ended in mid-afternoon. How complete was the Confederate victory on that day was disclosed after the war by General Meade, who said that if General Lee had followed and placed his batteries on Culp's Hill that evening the Federal Army would have been forced to withdraw.

One need only climb the observation tower near the site of General Meade's headquarters (see Color Plate V) and from that vantage point view the second battle field to appreciate the tremendous price the Confederates were destined to pay on the 2d and the 3d for their victory of the 1st. For here Nature had provided General Meade with a veritable citadel ready for fortification, in which to await an attack, and events had given the Army of the Potomac time to occupy this position and entrench itself.

Here the legions of Lee endeavored to overpower their gallant foes of many a Virginia battle field. Here they waded through blood at the Peach Orchard and the Wheatfield; here they faced the most withering blasts that war at its bitterest could bring upon them, as they struggled for possession of Devil's Den and the rocky heights of Little Round Top, where the issue hung on the quick eye of General Warren and the matter of a few minutes (see Color Plate VI).

WITHIN 150 FEET OF SUCCESS

Thrice victory eluded the grasp of Lee in the fighting of the second day. Night closed down upon the frightful scene of carnage with the flower of Stonewall Jackson's old corps in Meade's trenches, on the southern slope of Culp's Hill, within 150 feet of Meade's line of retreat and close to his reserve parked artillery. There they slept on their arms, little dreaming how close they were to victory, as they settled down to a fitful slumber.

Could they hold their gains on the morrow and drive through the hundred paces to triumph? At 4 o'clock the next morning guns boom out their demand for

THE MOST FAMOUS BATTLE FIELD IN AMERICA.



BOYS IN BLUE ON THE FAMOUS WHEATFIELD AT GETTYSBURG.

Here, where their grandsires battled in '63, come Sons of Veterans to camp and drill to-day. Members of a Lancaster, Pennsylvania, company which retains the Civil War uniform.



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Natural Color Photographs by Orren R. Louden.

VETERANS AT HIGH WATER MARK (SEE, ALSO, COLOR PLATE III)

As one stands here, flanked by guns, monuments and markers, the scene is so peaceful that it is hard to imagine the living hell of fury that swept the spot when Pickett's Charge dashed itself to pieces. The two veterans at the left were participants in the Battle of Gettysburg.



© National Geographic Society Natural Color Photograph by Clifton Adams
 THE PENNSYLVANIA MEMORIAL

This most impressive of Gettysburg monuments bears the names of 34,530 officers and enlisted men of the Keystone State who fought here.



Natural Color Photograph by Orren R. Louder
 NORTH CAROLINA'S MONUMENT TO HER MEN

One Confederate soldier in every four who fell at Gettysburg came from the Old North State, which had 32 regiments in action.



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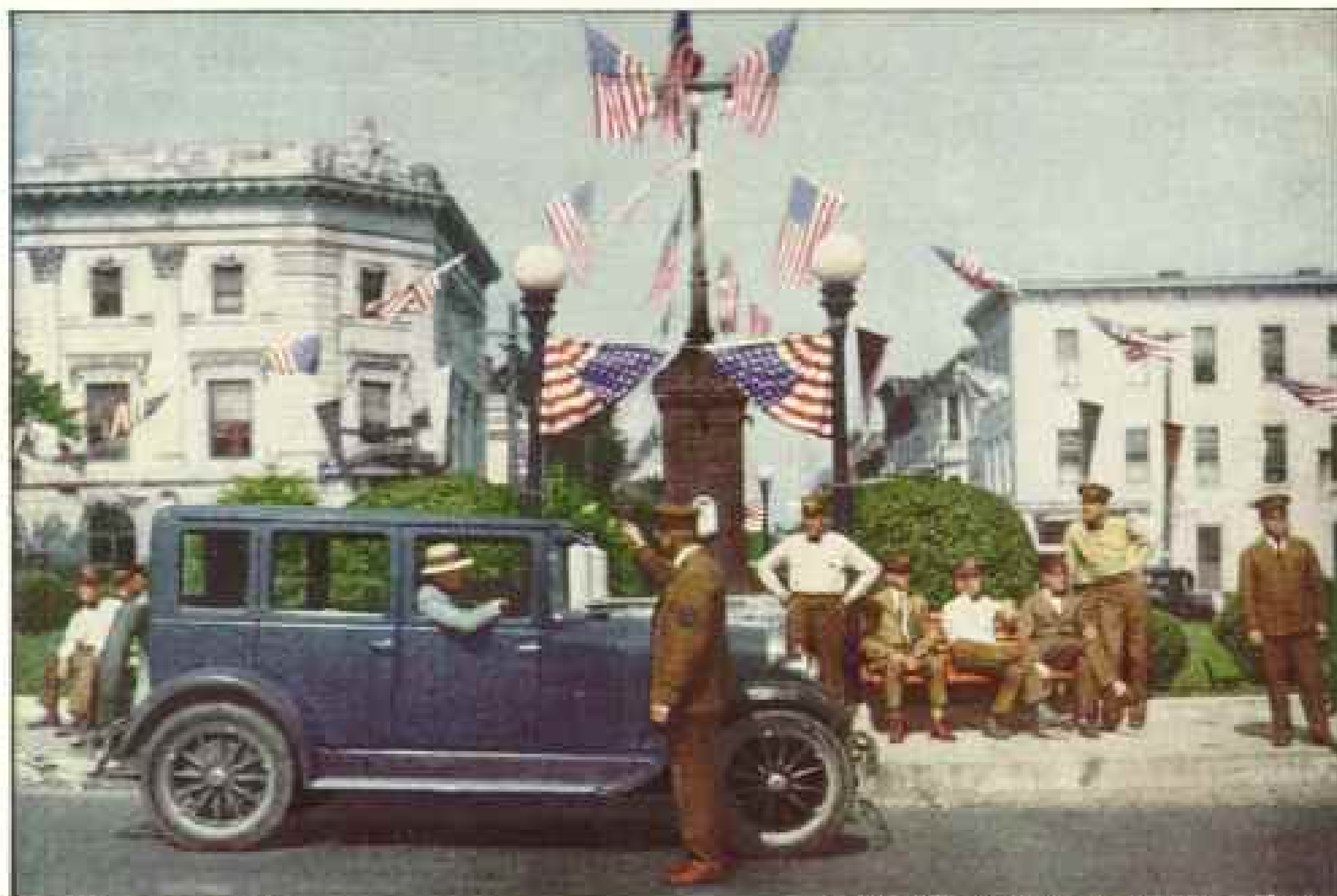
Natural Color Photograph by Clifton Adams

WHERE PICKETT AND HIS MEN ACHIEVED IMMORTALITY

From a position approximately where the barn now stands, Pickett gave the signal for the famous charge toward Cemetery Ridge. Of the 4,800 officers and men of his division who swept forward, barely 1,000 returned unscathed after reaching and holding momentarily a position at High Water Mark (see Color Plate 1).



THE SOLDIERS' NATIONAL MONUMENT
A part of "Fame's eternal camping ground" at Gettysburg.



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Natural Color Photographs by Clifford Adams

LICENSED GUIDES CONDUCT VISITORS OVER THE BATTLE FIELD

The Cemetery Division of the Quartermaster General's Office licenses guides only after rigorous examination. The number is limited to 100.

THE MOST FAMOUS BATTLE FIELD IN AMERICA



GENERAL MEADE'S HEADQUARTERS AT GETTYSBURG

Here the Commander of the Army of the Potomac conferred with his corps commanders.



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WISTERIA NOW BLOOMS WHERE LEE MARSHALED HIS MEN

The house at the left faces a road over which men marched to death in the sanguinary Peach Orchard.



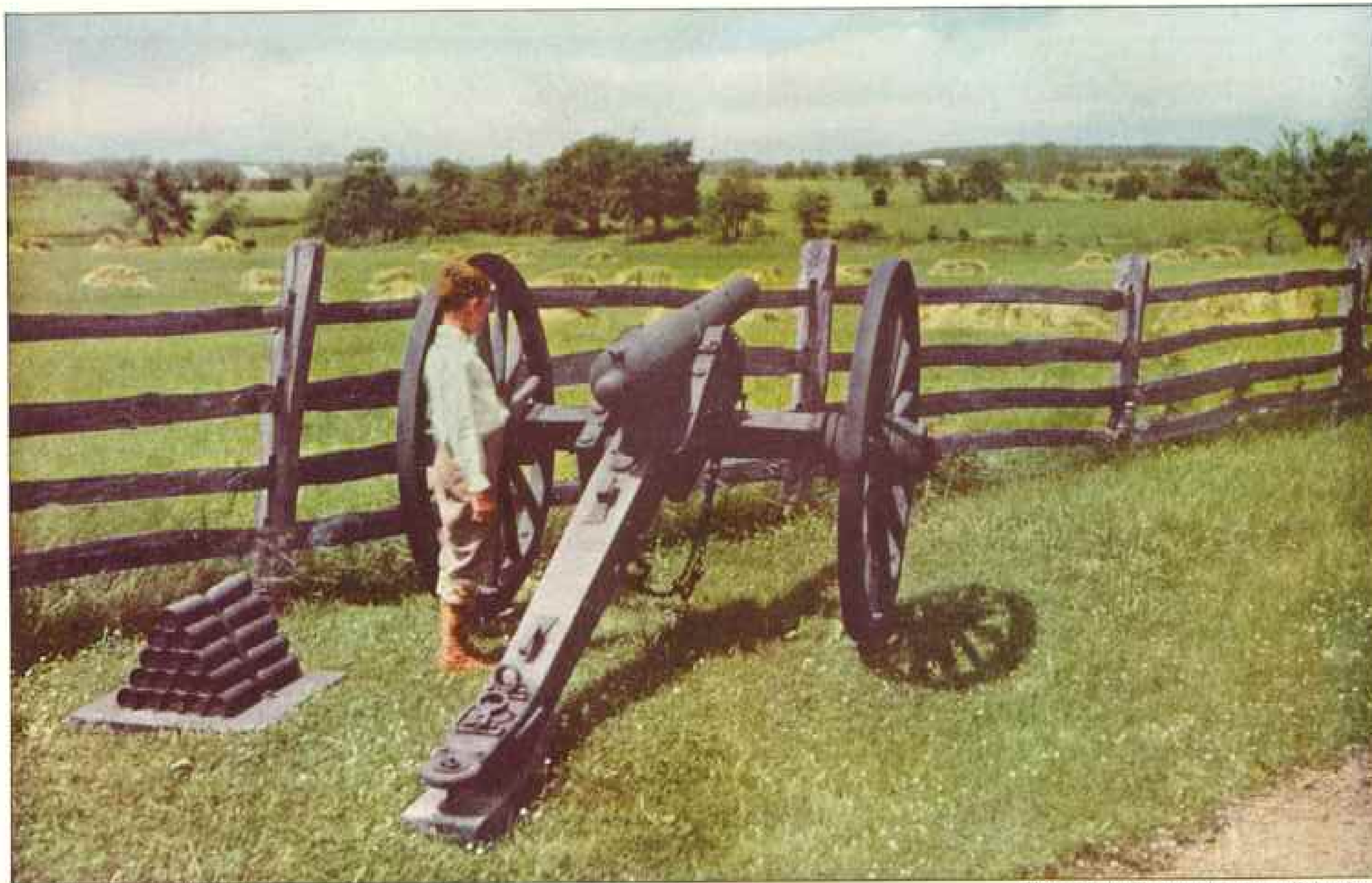
© National Geographic Society Natural Color Photograph by Clifford Adams
 GENERAL WARREN ON LITTLE ROUND TOP

But for this Union officer's quick eye and splendid initiative the pivotal hill would have fallen into the hands of General Lee's Army.



Natural Color Photograph by Otten R. Louden
 REVIEWING THE BATTLE FIELD

Two-thirds of a century after the conflict two of these men, who fought here, have returned to live again the stirring Civil War days.



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WHEAT IS NOW HARVESTED WHERE THE BLUE AND GRAY CLASHED ON THE FIRST DAY OF THE THREE-DAY CONFLICT

Natural Color Photograph by Owen R. Louden

Annually more than 800,000 visitors come to study the most famous battle field of American history. The points of special interest are indicated by more than 800 monuments, 1,400 tablets, some 300 granite markers and 419 pieces of artillery.



WILD MUSTARD BLOSSOMS WHERE BATTLE RAGED

While 300 guns filled the air with solid shot and shrieking shell, reserve Union infantry was massed on this sheltered slope of Cemetery Ridge to await the final thrust of Pickett's Charge.



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Natural Color Photographs by Clifton Adams

A FARMHOUSE HOSPITAL NEAR THE BATTLE FIELD

The toll of three days' battle at Gettysburg was 5,747 killed, 27,238 wounded, and 10,515 missing. Soldiers wounded in the action around Culp's Hill were treated here.

an answer. The battle is on. Artillery fire blasts their front and rakes their flanks. Musket fire throws a deadly leaden hail into them from almost every angle. Their position becomes an inferno. They charge into a blinding sheet of all-arms fire; they reel back, reform, charge, and are hurled back again. Again they reform and charge once more. At last, almost literally blasted from the field, the bugles sound the mournful notes of the retreat and General Meade holds the ground unchallenged.

Pickett's charge will ever live in the minds of men as the climactic episode of Gettysburg; but military men agree that in the menace it held, in the fierceness of the assaults that were made, in the carnage that was wrought, the attack made by the men whom Stonewall Jackson had led at Bull Run, Antietam, Fredericksburg, and Chancellorsville deserves an equal place in the annals of war. That attack lasted for six hours. Pickett's charge moved out at 3 o'clock, reached High Water Mark (see Color Plate 1) at 3:20, began its retreat at 3:40, and was off the field a little after 4 o'clock.

PICKETT'S CHARGE UNEXCELLED AS MILITARY SPECTACLE

As a military spectacle, that concluding act has never been excelled. Its prelude was played by 300 guns, as battery answered battery across the gently rolling fields over which the historic charge was to sweep. "Every position seems to have broken out with guns everywhere, and from Round Top to Cemetery Hill is like a blazing volcano," reported one officer. "The grand roar of nearly the whole artillery of both armies burst in on the silence, almost as suddenly as the full notes of an organ would fill a church," wrote another.

In an hour and a half the Federals slackened their fire, so that their guns might cool, wrecked batteries be replaced, and the atmosphere allowed to clear.

Forty-two Confederate regiments move out. Pickett leads them, with his own division in the center. The charge begins with the precision of dress parade. A murmur of admiration sweeps the Union line. And then its artillery opens again with every ounce of its reinforced power. Presently, torn by shot and shell, the charging host comes within rifle range. They press on. They are within 150 yards of their goal, facing death in a thousand forms.

Pickett's men melt like snow on a hot day, but a second and a third wave sweep on. They face double canister at 10 paces, but they silence the guns that fire them. Into Webb's rifle pits they leap and over the barricades. Armistead and his men vault over the stone wall. He falls mortally wounded. The momentum of the charge wanes and dies.

Raked with fire and cross-fire, there is nothing to do but fall back. But they return across the sanguinary field in such fashion that the repulse does not become a rout. Out of the 4,800 men of Pickett's division, not more than 1,000 return. Of the fifteen field officers and four generals, only Pickett and one lieutenant colonel escape unscathed.

GENEROUS GOVERNMENT TREATS NORTH AND SOUTH ALIKE

The Battle of Gettysburg is ended. As we walk over the scene and try to measure the courage of the men who fought here, we come to understand why there is pride in every American heart that this battle field is now a military park, and that it was dedicated in immortal words by Abraham Lincoln.

The fine generosity of the Federal Government, that knows no North and no South in the marking of those hallowed acres, cements in the firmest bonds of history the sons and daughters of those whose bravery and courage made the field the sacred spot it is.

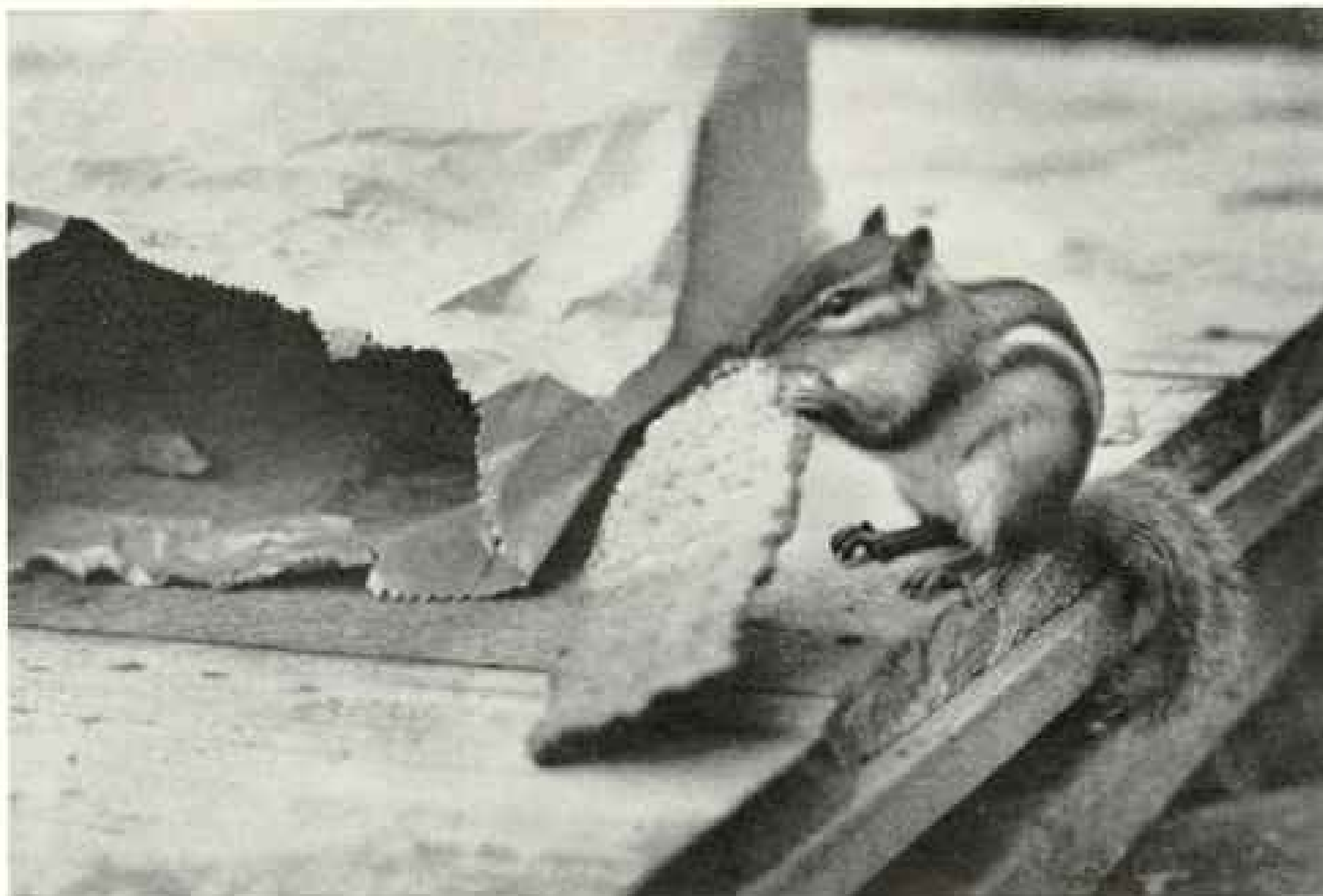
First established by the Gettysburg Battle Field Memorial Association in 1864, taken over by the Government in 1895, more adequately marked by the Gettysburg National Park Commission, the Park now consists of 2,530 acres of Government-owned land. It has twenty-two and a half miles of avenues, in addition to the State and county highways that traverse it. In it there are 83 statues, in addition to nearly 800 other monuments. There are also 1,410 bronze and iron tablets and 323 granite markers on pedestals, while 419 mounted cannon, caissons, and limbers show the artillery positions of the field.

As a recent Army report declares: "It has been well said that Gettysburg was in a measure the American soldier's battle, a battle of the ranks, a struggle of American prowess and courage, of discipline and tenacity, of unswerving fidelity and unselfish devotion, a contest of American manhood."



YOUNG BOBBY HAS LOST HALF HIS TAIL.

He tried to run off with these Graham crackers, but found them too heavy by far, and so he did his best to carry them all off in his cheek pouches.



WHILE SMALL CHIPMUNK RAN OFF TO BURY HIS TREASURE, BIG CHIPMUNK TOOK POSSESSION

He also found the Graham crackers too bulky to run off with, and so he sat down to eat them on the spot. Being bigger and stronger, however, he can eat them conveniently sitting up.

INTO THE LAND OF THE CHIPMUNK

BY RUTH ALEXANDER NICHOLS

With Illustrations from Photographs by the Author.

THE year I was eleven my father bought for our vacationing a little homestead farm in northern Wisconsin. Thus was set the scenery for ten years of delightful friendship with dozens of gay-hearted chipmunks, stodgy gophers, and all their many cousins and neighbors, friendly sometimes, but mostly otherwise.

Our house stood in a tiny clearing, beside a small lake some forty miles from the western end of Lake Superior. Drab, matter-of-fact words for such a country. For me, no other place can ever quite equal the thrill of it. Three miles we were from the nearest town, and that so tiny. We could reach it only by water, or over deep-rutted or corduroy roads, twisting through unbroken thickets of tangled underbrush, or past great trees which had somehow escaped both ax and fire.

Imagine a town-bred child who hated cities, who loved woods and water and space, and who carried to the point of obsession a love of all birds and animals, wild or domestic, turned loose in such a place! Across woods or lake came the drum, drum, drum of the partridge; the maniac daytime cry of the loon and its long, lonesome night cry; the bark of wolf or coyote; the whimper of the wildcat.

Deer strolled casually into our clearing; porcupines climbed screen doors at night, and the occasional footprint of a bear announced a more exciting nocturnal marauder. It was not uncommon to meet a sedate and apparently friendly skunk ambling down the path, tempting one to stroke the beautiful fluffiness of it. Safe within their doorways, woodchucks spoke such obviously shocking language that I consider it a blessing never to have learned their dialect. There were weasels, too—beautiful, delicately modeled creatures, who popped nervously in and out of unexpected places. That alert inquisitiveness of theirs—a sort of “I-want-to-be-friendly-but-I-wonder-if-I-dare” way—was enticing, but their blood-thirsty inheritance, evidenced by the dead meadow mice that I occasionally found, with only a tiny blood clot under a foreleg, proved too great a barrier for any friendship with the miserable, bloodsucking little beasts.

Loons never ceased to fascinate me. I wish everyone might watch a flock of them at play. To see them rise half out of the water, with only wing tips dipping the surface; to watch them race wildly across the waves in straight lines, circles, any way, four and five at a time, throwing up on each side of them great wings of gleaming water and uttering shrill, weird laughter—it's a breath-taking sight.

A NIGHTMARE OF GREEN FROGS

One night we had a visitation of tiny frogs. I know not whence they came, nor whither they were going. There must have been hundreds of them—light-colored and so delicately formed they were almost transparent. Every step one took caused horrible slaughter. They became a nightmare and, like a nightmare, were gone in the morning.

All of this—to see, to learn, to explore—was well enough, but I had another obsession. I have always rebelled against the wild, hunted look in an animal's eyes, and harbored dreams, born I know of a real feeling of kinship with them, that somehow, someday, it must be possible by a look, a gesture, to break through that crust of grafted fear.

Couldn't one, by sheer force of will, bridge that gap and compel recognition of one's friendliness? No, of course it can't be done that way; but, again, of course hours of patience do bring results. I tried to make friends with everything around the place. For a time, before a heron or fish ate it, I had a large frog. Probably he was deficient mentally, for I could go down to the lake shore and pick him up at will, hold him in my hand, and stroke his head gently.

My next efforts turned upon fish. They are easy to tame. I began by throwing bread into the water many times a day. Sunfish, bluegills, and perch were my first boarders. After they had grown to expect and like the food, the next step was to hold it in my hands under water and wait. They became absolutely fearless. The mere vibration of my step on the dock would bring them floating lazily toward the surface. There, in rows and groups, they would stay



ALDER COVE, WHERE THE AUTHOR'S FRIENDSHIP WITH CHIPMUNKS RIPENED

Twenty feet behind the "lean-to" kitchen at the back of the house lies the old log cave upon whose roof she played with her pets.



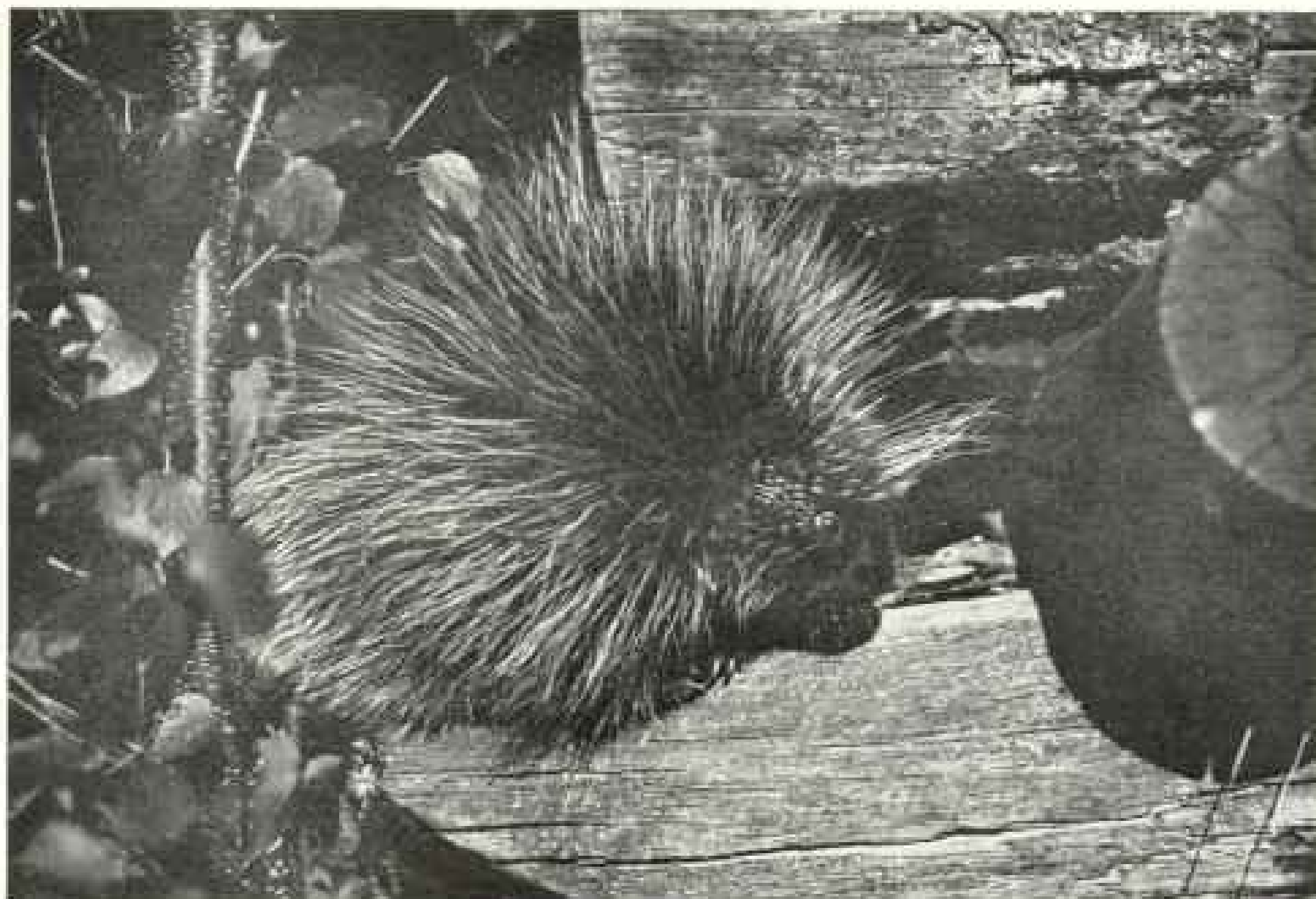
READY TO RUN

When any animal suddenly becomes rigid like this, with a fearful, listening look, then be very quiet and rigid yourself, for the least move on your part at such a time will send even the tamest skittering away.



THE SENTINEL

A characteristic gopher position when he is listening and deciding whether to take alarm and scuttle or continue his hunt for food. Note the curious, rosettelike growth of fur on the chest.



BILLY PORCUPINE CORNERED

Here are plainly shown the long white hairs which are such quick barometers of enemy location. The short white projections directly behind the eye are quills. Quills in as close an array are concealed in short black fur that grows thickly all over his body (see, also, text, page 86).

until food appeared, fins and tails slowly fanning the water, eyes turned solemnly upward.

One day, in the deeper water, at the end of the dock, I saw my first shiners. By tossing bread far out into the lake, and then nearer and nearer each day, I coaxed them in. They grew in time to associate food with the splash it made as it struck the surface; so that it was not long before the mere splash of my hand in the water brought them in swiftly. Nervous, darting fish, they proved much the most interesting of any. They were from four to nine inches long, dark above, like the bottom of the lake, and gleaming white beneath, as the sky looks from under water. They needed this protective coloring, for they were the natural prey of the bass and ugly-mouthed pickerel.

SENTINELS WARNED THE SHINERS OF AN ENEMY'S APPROACH

They apparently had a set of two or three scouts, which never came in for food, but always circled on the edges of the school. When danger threatened, these

scouts would give a violent flop, and instantly every shiner would be gone. In fact, whenever any sudden movement of mine sent them darting away or lunging completely out of water, I would look for and find a game fish. Somehow the word had gone out, "Beware!" and every one was keyed to act at the first suggestion of danger.

Normally I could swing my hands among them, even pick them up at will. For a stunt, I used to catch them and put them in a bucket of water. My bucket filled as fast as I could put my hands in the water and take them out again. The fish did not seem to mind. The sunfish would even lie quite placidly on my open hand for a few seconds before they would flop off into the water again.

How furious I used to be at the pickerel! To see this dull-green log lying sullen and threatening along the bottom of the lake not two feet from my hand; to watch those wicked eyes and know that before he left there would be a sudden quick turn, a shower of scales, and Sir Pickerel would have swallowed a fat and juicy shiner. The



CATCHING FISH BY THE HANDFUL

Here, on the end of the dock, the author would lie by the hour watching the fish that came to her hand by the dozens. Two fishes have just flopped back into the water beyond her hand and one other is just sliding across her finger tips.

pickerel swallows his prey head first, and his sharp sets of teeth sometimes send the scales into the water like a shower of snowflakes.

I never managed to tame a pickerel. With bass I was more successful, having one or two that I was able to touch. The perch were next hardest to tame, the sunfish the easiest. Nothing seemed to disturb them. They were too spiny for the pickerel's digestion, I think, and so year after year they lived under the dock and grew fatter and lazier. After the first year, all I ever had to do was to splash the water with my hand, hold some bread underneath the surface, and out they would float and begin to nibble bread or hands without discrimination.

Once I experienced an invasion of tiny minnows. I spent half a morning unsuccessfully coaxing them to eat from my hand, but in the afternoon one bold little fellow darted over and grabbed a mouthful. Apparently it was the signal, for almost simultaneously my hand was encased with a wriggling mass of fish, their tiny

mouths nibbling every part of it. I could scoop them up in double handfuls.

As temporary as the frogs, these little fish stayed only two days, but during that time they covered my hands every time I put them in the water.

CHIPMUNKS AND GOPHERS PROVE MORE INTERESTING THAN FISH

These pets were interesting, of course, but they did not quite satisfy; so I turned naturally to the chipmunks and gophers, so numerous all over northern Wisconsin. With them I began a series of friendships that, renewed summer after summer, gave endless joy and half answered that primitive urge for reinstatement into the animal world.

On the roof of an old log cave I established my bread station. An ideal spot it was, on the edge of our clearing, a chipmunk paradise of sunny open spaces and crumbling logs, bordered by a thick undergrowth, mainly raspberry, blackberry, and the wild pin cherry—all favorite foods of the chipmunk.



A WHIMSICAL, FUN-LOVING LITTLE RASCAL

To get a photograph of a small chipmunk at pause when he wasn't eating was a matter of luck and patience. The author had almost given up when this opportunity arrived.



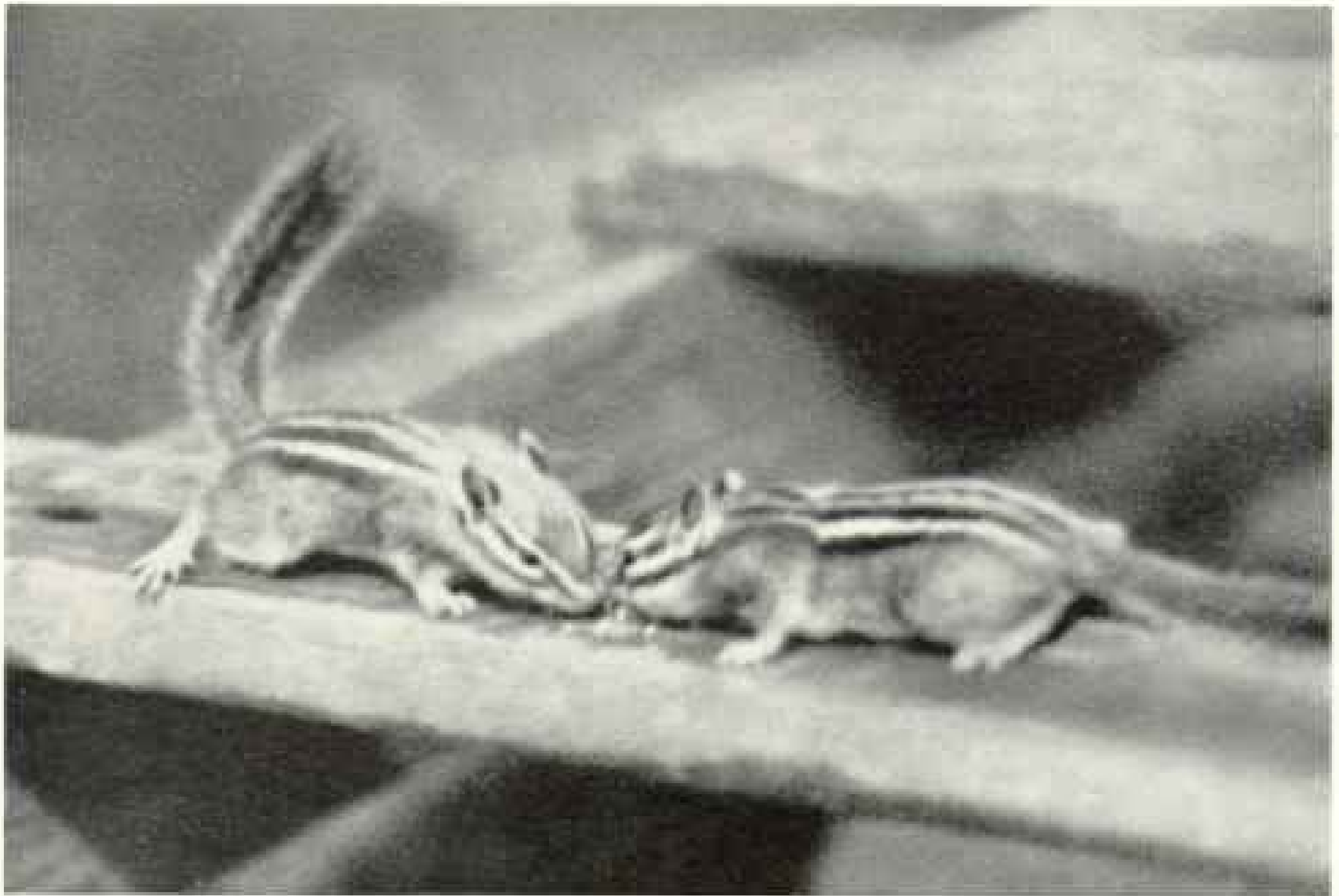
BY THE TWINKLE IN THEIR EYES YOU MAY KNOW THAT THEY ARE FRIENDLY AND HAPPY



WITH LIFTED PAW HE MARVELS

OBEYING A COMMAND

"Two difficulties presented themselves in getting certain poses of the small chipmunk. They moved so quickly and they were so friendly and inquisitive that they would leap directly upon the camera instead of staying in front of it. When a small chipmunk came running toward me, he was almost certain to stop for the merest fraction of a second to reassure himself that everything was all right. Friendly, trusting, inquiring, to me that expression embodied the whole personality of the small chipmunk. I despaired of ever getting it, because the moment was so brief and there was no certainty of telling when that glad scamper toward me would be arrested. In exasperation one day, I snapped my fingers at one little scamp (lower right) and shouted, 'Stand still, you rascal!' No one had ever spoken that way to him before. He stopped, most surprised, and I got my picture."



"TOO FULL FOR UTTERANCE"

"When I had begun to think that luck in photographing chipmunk salutation was never going to favor me, I resorted to strategy. Perhaps, I reasoned, if I were to crumb bread all along an elevated narrow board, one chipmunk might begin at one end and another from the other, and when they met in the middle—well—! Fortune did favor me in attracting two chipmunks at the same time, but, alas, when they reached the center, either they were old friends or too full for undue exertion—anyway, this is just what happened!" (See, also, page 85.)

Only a person with the unlimited leisure and patience of a child could ever have reached the degree of comradeship that I proceeded to establish. They did not become merely used to my presence and sneak cautiously near me for food. I became one of them, a real friend, around whom they could romp care-free, careless, happy, natural.

What endless tedious hours and days it took before we reached this point, I have no way of estimating. When I ventured out, how still I must be—still, stiller, scarcely daring to breathe, almost praying, saying over and over deep within, "I won't hurt you. You must come! Can't you feel I'm your friend?"

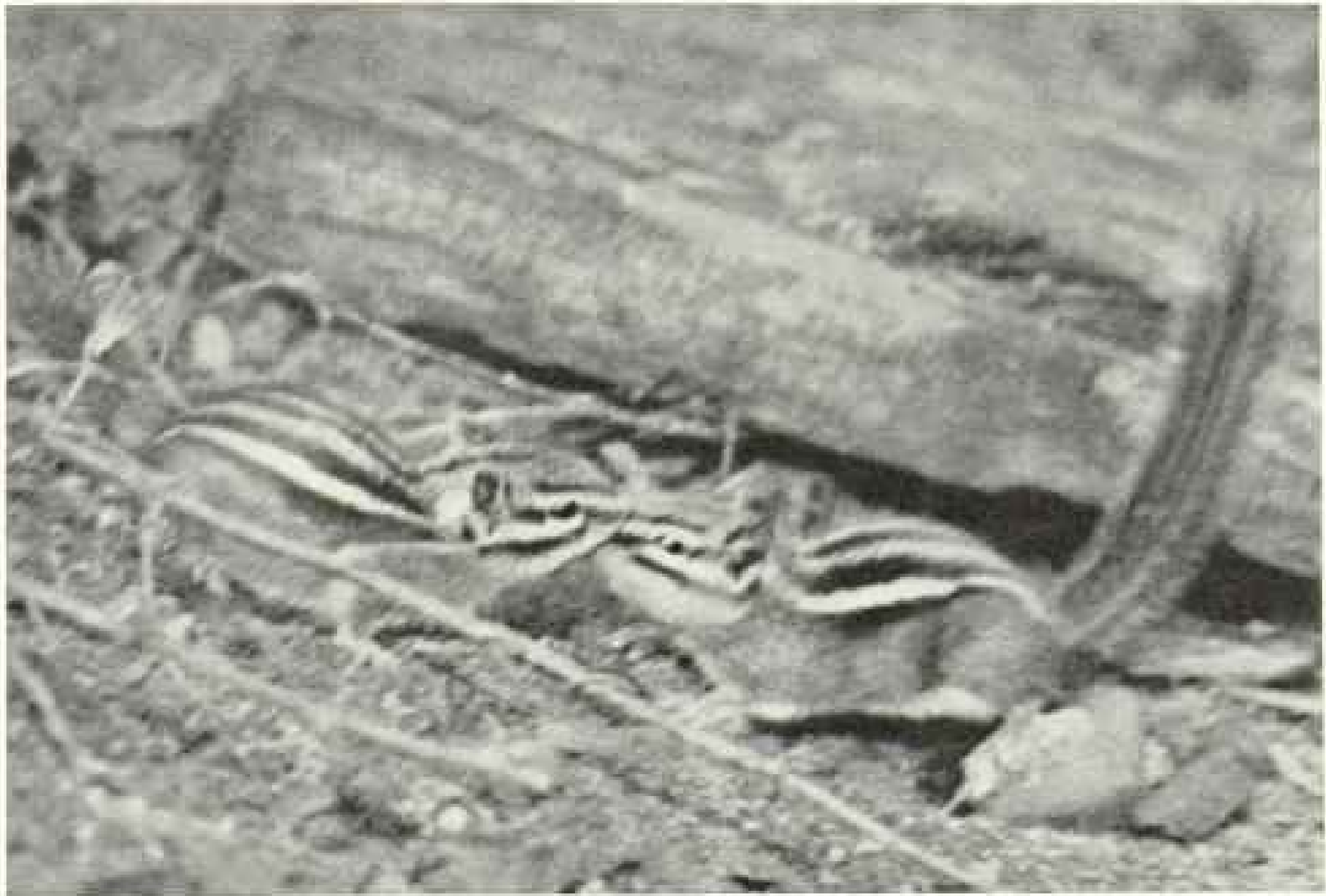
But, alas, taming wild things is a waiting game, and there are no short cuts. The one who can hold out the longest, be he chipmunk or human being, wins, and that's all there is to it. No easy task, let me warn you, this outlasting the caution of the chipmunk in the land of the too-friendly deer fly and mosquito. Let what will crawl or

bite, one must not stir, for there can be no way of knowing when some bright eyes may not be watching, and one movement at the wrong moment, be it ever so slight, can wreck all the confidence built by an hour of statue-like waiting.

FRIENDLY RECOLLECTIONS WITHSTOOD THE TEST OF TIME

At the end of that first summer I said good-bye with real sorrow. "They'll forget me, and I'll have to begin all over again next summer," was my thought. Even so, the first thing I did upon my return was to call them—once, twice—but not a stir. Well, it was unreasonable to be disappointed.

I stopped near the roof of a low log shed built against the hillside on which I was standing. Just one more call for luck. A scurry of tiny feet, a flash of brown, and there, poised on the ridgepole, stood an eager, quivering frisk of a chipmunk, inquisitive nose sniffing the air, eyes bright with friendliness. Another call, and as di-



GREETINGS IN CHIPMUNK LAND

One of the hardest pictures of all to get, because it is sudden and so fleeting: an affectionate nose- or cheek-rubbing, and then each is gone like a streak, often in opposite directions. Sometimes a chase ensues.

rect as an arrow came that little chap to sit on my foot and raise himself on his hind legs for food. In no time my friends were back in greater numbers than ever.

So it has been every year since. I have never had to respend those tedious preliminary hours, this although no one lives in the house or feeds them during the intervening time. Twice I have even skipped a summer, yet each time I find at least one or two, and usually more, who are as ready to eat from my hand the first hour of the first day I return as on the day I left them.

This raises the question of instinct, memory, passing on of acquired instincts, and all that. I leave the solution to the psychologist. That something exists, I know. To be sure, I, who frankly like to imagine, find it easy to countenance a lingual passing on from generation to generation. Grandfather or Grandmother Chipmunk says to young Frisk, or Scamper, or Mischief, "There is a tradition in our locality, children, . . ."

Of course, it may be merely another habit groove, but no theory that one wishes to adopt can make any less interesting the

fact that a chipmunk may be so conditioned that ten months after he has heard a call he will instantly respond to it.

That they learn from one another by observation, I have seen demonstrated too often to doubt. For instance, one day I put some grain in a "niddy" pocket. It took a little maneuvering to guide one to this feast, but when one did follow my directing hand he was happy as a child and worked with amazing speed, quite as if he wanted to eat all before some one else dared to share his secret. He had a monopoly, for once in, only the tip of his little brown tail was visible.

But on one return trip another chipmunk saw him and became an amusing picture of hesitation, doubt, and yearning. The newcomer was, perhaps, two feet away, on the rung of a ladder. Never taking his eyes off my pocket, he kept running back and forth, back and forth, on this rung. Occasionally, for his benefit, I stirred my pocket and brought my visitor popping to the edge. When Number One scurried off to store his treasure, the curiosity of Number Two got the better of him. With in-



THE CHEEK POUCH ON THE RIGHT IS FULL.

finite caution he climbed up to my pocket and took the plunge—something he never would have done sight unseen.

This is, of course, part of the reason that, with only a nucleus of two or three to begin with each year, the taming was so much easier than at first. It cannot explain all.

SLOW MOTION IS NECESSARY IN DEALING WITH CHIPMUNKS

If you watch the eyes of any animal, you will find that they are the true barometers of its reactions. A chipmunk might be eating placidly on my hand. Suddenly a look of terror would leap into his eyes. Some sound too delicate for my ear had filled him with dread. He might stay perfectly motionless for a full minute, listening, lis-

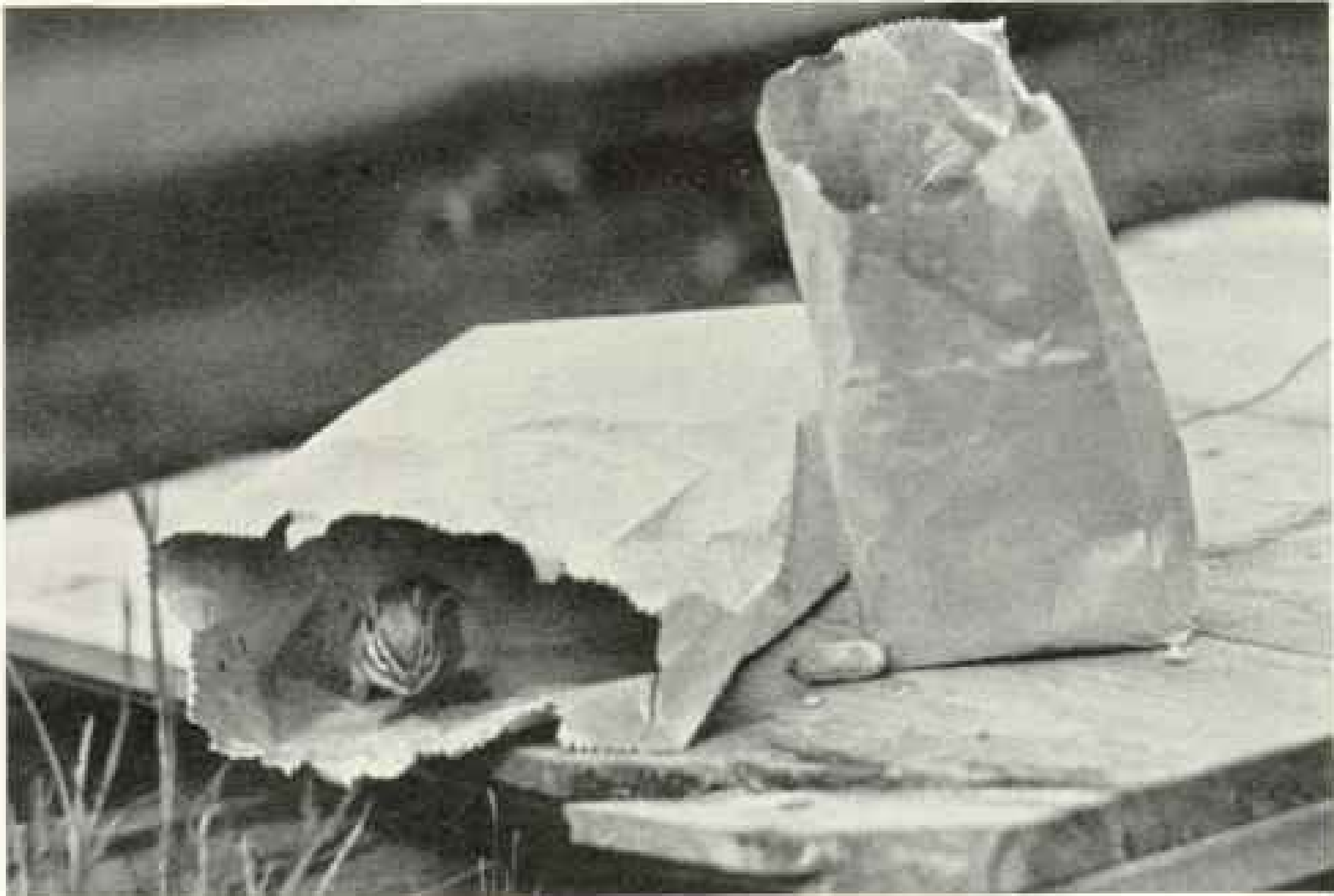
tening. If the cause of the noise materialized, he would skitter off; if not, he would suddenly relax, and contentment reflooded his eyes; but during that period of fear, the slightest stir on my part was fatal.

When their eyes twinkled with friendliness, I could inclose them with my hand, I could stroke their fur—in fact, I could do almost any reasonable thing, provided my movements were slow and gentle, not jerky or unexpected (see illustration, page 89).

I never tried to pick them up. I doubt if they would have let me, for that would have been imprisonment. I had one little fellow, however, who used to run along the ground to me, jump into my outstretched hand, and let me raise him gently to the level of my eyes. I can see him yet, twinkling at me (I use that word frequently, because to me it is the chipmunk way of smiling), while he ate a bit of bread or stuffed it busily into his mouth. When he was ready he would jump across to my shoulder or run up my arm and from there swing skirtway to the ground.

Like Rikki-tikki, the mongoose, a small chipmunk's slogan is "Go and find out." At one time I had a porcupine (see page 80). We called him Billy and he lived in a packing box. Billy was massive, slow, and deliberate, but he used to walk very easily along the edge of the packing box. One day Frisky Chipmunk saw him and became wild with curiosity. Said he, "That big thing can't see me if I sneak up behind him. I'll just run over and see what he's made of."

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A TINY CHIPMUNK INVADES THE SOURCE OF SUPPLY

Now, of course, a porcupine can't actually throw his quills, but he does have on his back and on his powerful, flat paddle of a tail long, sensitive hairs. The merest touch on those hairs tells him not only of the presence of an enemy, but the exact location, and quicker than eye can follow, quicker than anything but a chipmunk can move, that tail strikes, leaving everything it touches a painful mass of barbed quills.

Frisky Chipmunk smelled the nearest thing—one of those sensitive, long hairs. Flap went the tail! Never have I seen a chipmunk leap so quickly or so high. At least two feet upward from the edge of the box he shot, and it was another three feet before he struck the ground and scampered chattering away. Unhurt, yes, but well cured of porcupine hunting.

THE GOPHER IS A DISTANT COUSIN OF THE GROUND SQUIRREL.

Thus far I have spoken of chipmunks and gophers as if they were all much alike. This is far from true. What is called in Wisconsin a gopher is really a ground squirrel, distant cousin of the chipmunk. He has some of the habits of the prairie dog, but is heavily striped and dotted and more the color of the chipmunk. Techni-

cally he is known as the thirteen-striped spermophile. I shall continue to refer to him as gopher, although his exaggerated dignity might countenance the longer name.

My first visitors were dainty little chaps, not more than three or four inches long, with uptilted, bushy tails nearly as long as their bodies; my second ones a stockier, more deliberate, grayer chipmunk, at least twice as big as the others. At first I thought these smaller ones were the young of the larger, but observation of the markings, behavior, and general shape of the two soon showed me they were each a distinct species.

THE SMALLER SPECIES TAME MOST EASILY

The racial characteristics of these three groups of the squirrel family are as different as their appearance. The little four-striped chipmunks are the sprightliest, merriest, most lovable, and most intelligent. Beyond doubt, they are the most sociable. Dainty, brown bunches of fur and animation! It is that friendly spirit, mixed with a big bump of lively curiosity, quite as much as their appetites, that makes them so interested in you and everything about you. They play and romp and run like children. Always up to tricks, always enjoying life,



CURIOSITY IS THE SMALL CHIPMUNK'S MIDDLE NAME
He must know about everything immediately (see text, page 87).

light and delicate on one's hand as a tuft of down, it's an everlasting joy to watch them.

To be sure, the big rascals are interesting, but they never can be as attractive as the little ones. They are stronger, more pugnacious, less intelligent, and not as lightly graceful. Because they are wavier, they are a trifle harder to tame. It was amusing in those first days to see one of them, safe under cover of a board, peer curiously, wonderingly at the little ones, who were having such a satisfying meal. At last, most unwillingly convinced, he would creep cautiously forward, but so haltingly.

When, after endless dodging, retreating, and stopping, he finally did come, he was

often so stupid that he would try to run off with my thumb instead of something more palatable, and under my protest would become wildly puzzled.

Here is another essential difference between the big and little. When the smaller attack unyielding fingers, they know at once it is no use to struggle; but let a big one come near and I am on my guard. However, I never had any of my pets bite hard enough to break the flesh.

Anyone acquainted with gophers knows the wild speed with which they make for cover at the first hint of danger. I had never thought they could be tamed, but toward the end of that first summer a daring chap climbed into my lap. Before that vacation ended I had at least a dozen of them, and since then, like the chipmunks, they have never needed that preliminary training.

If anything, the gophers grew tamer than the chipmunks, although it seems a little unfair to say that, as the former are such greedy creatures. A chipmunk enjoys playing, exploring, making friends; but, alas, when a gopher can't find any more to eat, he goes home!

I suspect it's the glutton in them that made the gophers accept so placidly any pranks I chose to play. I could pet them and inclose them with my hand. By holding a piece of bread just out of reach and a little in advance, I could make them stand on tiptoe and walk on their hind legs exactly like small trained dogs. They would clasp my fingers so tightly and bite into the bread so hard that I could lift them high in the air by their own grip. They didn't mind,



CONFIDENCE ESTABLISHED

"With care I could inclose any of my pets in my hand. The gophers would just go on eating calmly. The chipmunks would jump through my fingers, but otherwise show no concern."

either; merely dropped back to the ground and waited patiently for me to stop teasing and get down to my business of the commissary department.

A CONTEST IN STARING

Some people do not like them. "Too snaky," they say. They do look so, as they glide stealthily through the grass. They amuse me, however. I have seen people who looked upon life with that same too-serious, round-eyed dignity. I call. One hears, pops out of nowhere to look at me, drops back, and hurries forward; pops up and peers again questioningly, like a shortsighted old gentleman. If somewhat new to the situation, his doubt may freeze him,

and there he will stand, stiff and straight as a pole, unblinking, motionless, staring, staring, staring! And there I sit, stiff and straight, staring, staring, staring!

It is a contest. If a too-insistent deer fly or mosquito does not wreck my self-control, Sir Gopher, in the course of three or four minutes, may drop suddenly on all fours and come toward me, to stand at my feet and beg for bread like a puppy, or climb into my lap and stuff to the utmost capacity of stomach and cheek pouches.

Sometimes I would drop or toss a piece of bread to watch them pounce upon it as if it were alive. A common food is the grasshopper, which they are marvelously skillful in catching. They follow the jump



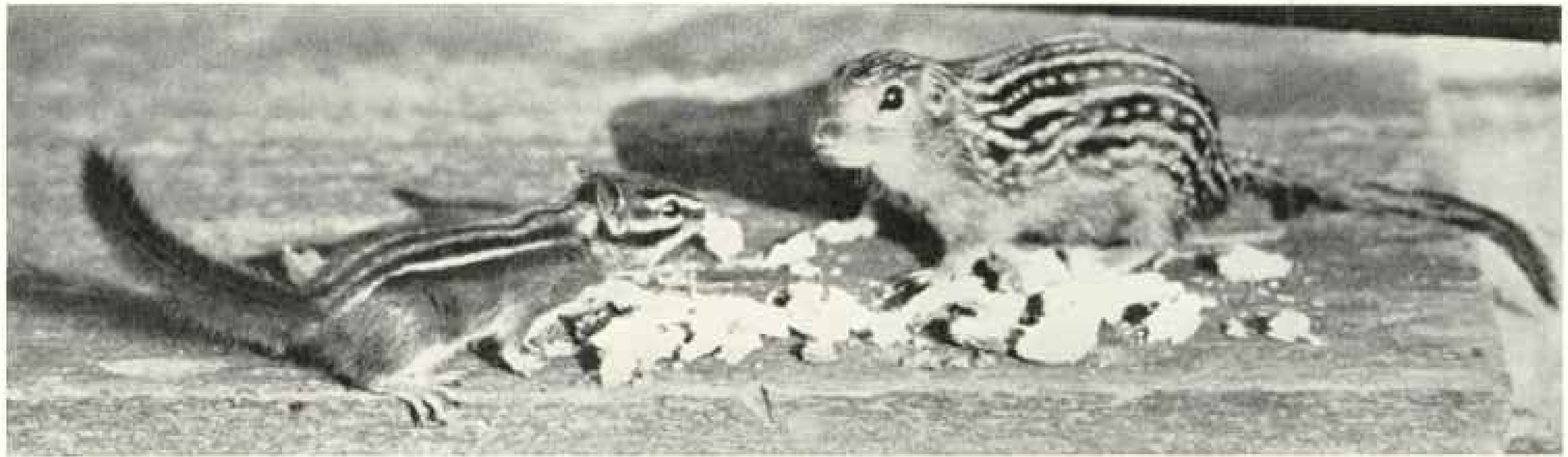
ALL THE CHIPMUNKS HAD TO BE TAUGHT TO EAT PEANUTS.

The first time this one saw the nuts he picked them up, nibbled the shells, rolled them around, and finally threw them down as hopeless (see text, page 97).

66



SMALL CHIPMUNKS NEVER SEEM TO BE ABLE TO MAKE UP THEIR MINDS WHAT GOPHERS ARE.



THE LITTLE FELLOWS ARE HALF-AND-HALF AFRAID OF THE GOPIERS



LITTLE CHIPMUNK AND BIG

The large chipmunks chase their small cousins relentlessly, but the small ones are so much quicker and more agile than the clumsy big ones that they steal food and are off before the large ones know what is happening. The last thing the author saw on her ground glass as she pressed the trigger for this picture was the small chipmunk grabbing a piece of bread. When the film was developed young Scamper was almost out of the picture—evidence of the lightning speed with which these small animals move (see, also, text, page 93).



CAMOUFLAGE!

A gopher sneaks through the undergrowth of weeds. It is amazing how quickly he can hide in such a tangle of sunshine, brown twigs, and dead grasses.

with a leap of their own, so well aimed and so quick that they are on the grasshopper before he can move or know what has happened. Clasp the insect in their hands, they devour him humanely, head-first. Hence, no doubt, comes the trick of leaping up and pouncing on the thrown pieces of bread.

To illustrate how tame they grew: One day a gopher climbed into my lap and made off with a big Graham cracker. I explained to him that he couldn't have a whole cracker and took it away. He made no protest, nor did he run away, but followed my hand docilely and nosingly until I broke off a piece of the cracker for him.

BATTLE SCARS SERVE AS DISTINGUISHING MARKS

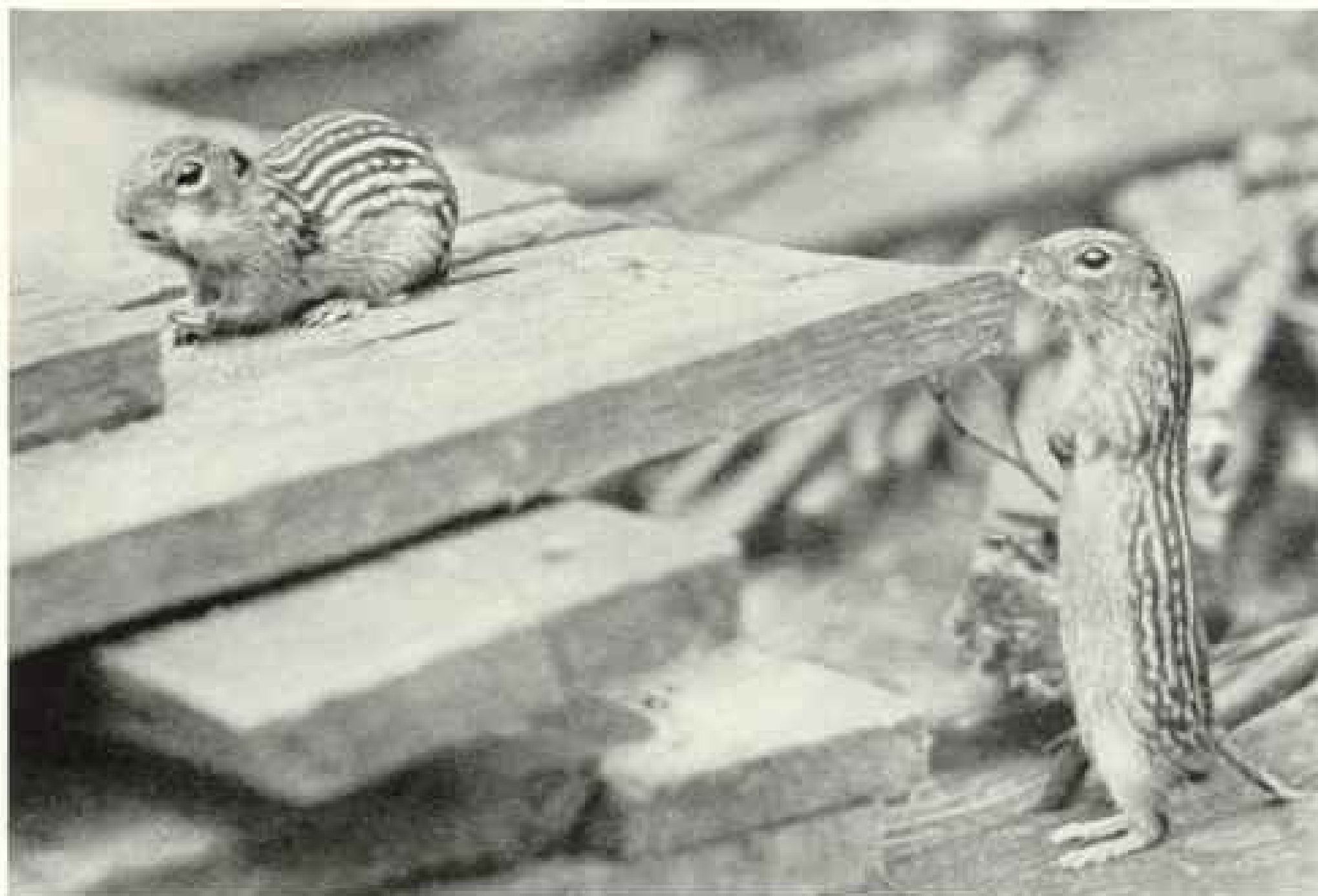
Not only did each species differ widely, but the individuals of each could in many cases be distinguished from one another. This might be due to a variation in marking. Spot had a deep black smudge on his nose. Development played its part. Tiny was an undersized dwarf. Usually the difference was an accidental one, due, alas, to too much fighting, which I never was

able to convince them was going out of style.

Little Bobby and Big Bobby had both lost half of their tails; Nick had a "nick" out of one ear. Then, exactly like human beings, there were those so markedly different by temperament—tamer, more aggressive, or friendlier—that they could be recognized even at a distance.

One or two gophers always stood out from the rest because of keener intelligence. For instance, one day I was coming toward the back door. On the step sat a gopher watching me. Within fifteen feet of the house a water snake wiggled across my path. I stopped to watch him stick out his tongue. We were having a lively conversation when suddenly the gopher (he had evidently stood the nonsense as long as possible) dropped on all fours, dashed up to me at full speed, grabbed my shoestring with his teeth, and, propping his two front feet against my foot, gave several quick, vigorous tugs.

He started off, changed his mind, ran back to give a few more tugs, and then, turning with lightning rapidity, he raced back to the step and his original position.



THE GOPHER ASSUMES MANY POSES

This picture shows two—the polelike attitude, when he uses his tail for support, and the flat, humped-up position used so often when foraging. Note the position of the gophers' hands—the one with paws tucked in neatly against the breast, the other obviously picking up bread crumbs with the fingers, in a very human fashion.

His whole attitude was an impatient "Come on! I've been waiting for you long enough, and you've no business to be talking to that low-down thing anyway!"

Utterly astounded and curious, I left the snake. The gopher never stirred a muscle as I walked to him, and when I sat down he climbed into my lap and began to eat.

DIPLOMATIC RELATIONS BETWEEN CHIPMUNKS AND GOPHERS

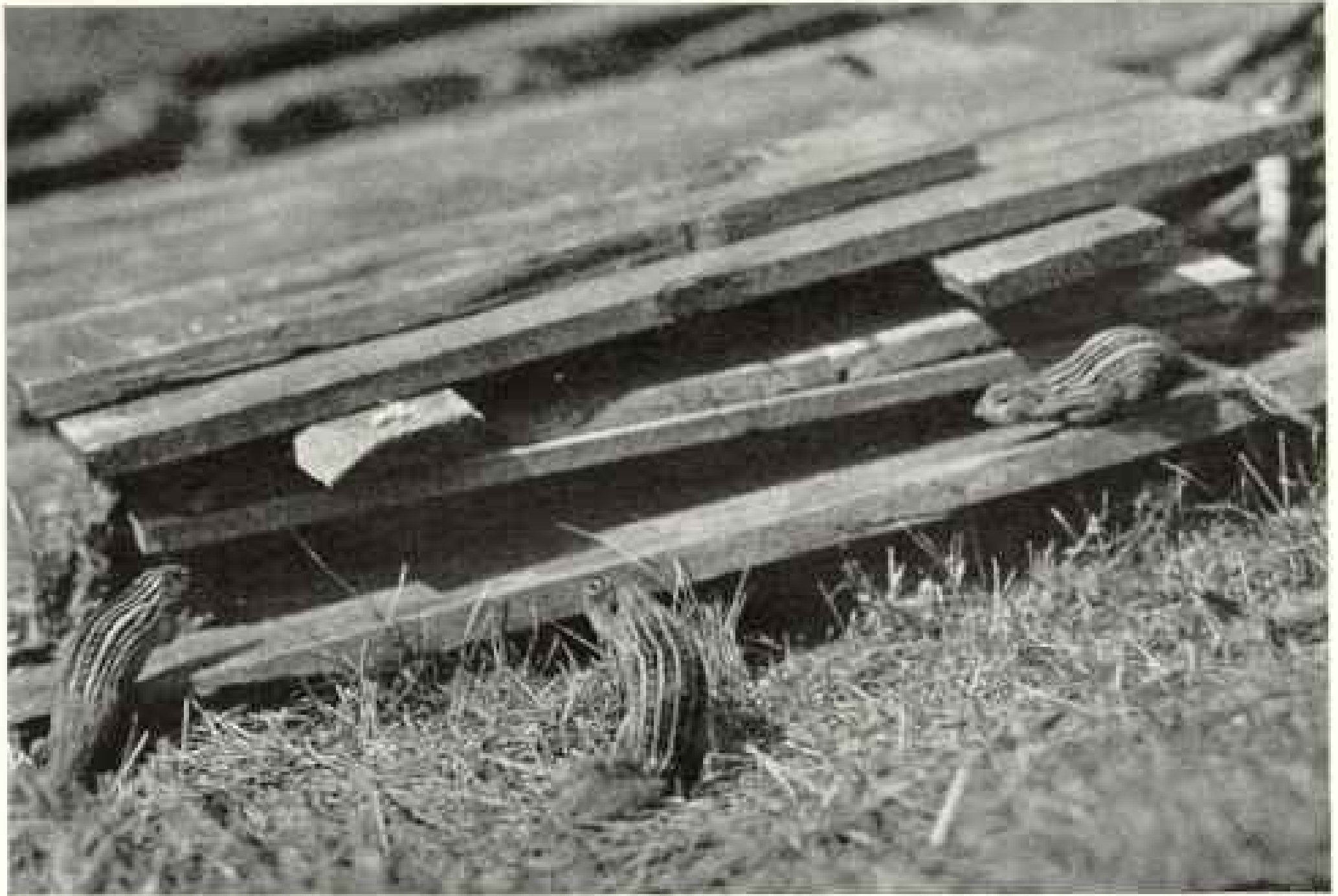
The diplomatic relations between the chipmunks and the gophers, and even between the two chipmunk species, were interesting. The big chipmunks and gophers were apparently oblivious of each other. Oh, perhaps if a chipmunk came too close to food that Sir Gopher considered his special right, he would sound the same warning he would give to a gopher he did not like—turn his tail to a switching bottle-brush and, while never stopping his industrious eating, keep up a steady growl deep in his throat.

The chipmunk did not even vouchsafe this recognition.

But with the little chipmunks the case was different. About those clumsy gophers my lively pets were eternally curious. They were always sneaking up to one and stretching as far as they could for an inquiring smell of that queer giant, so much like themselves and yet so different (see page 88).

Sir Gopher would growl, and, oh, that was scary, until they learned, or at least the livelier, more courageous ones did, that it was only gopher bluff. Then the impudent scamps could make themselves a real nuisance to the stolid gophers. I saw one such mischief—a gopher would make four of him—try to scratch a bit of cake out of the big chap's claws. The gopher? Oh, he merely blinked and growled a little, but kept right on eating. Such truly enviable dignity!

As for friendliness between the big and little chipmunks, there simply is no such thing. The big ones chased the little ones on sight. They were little better than bullies; but nothing can daunt a really gallant little chipmunk. He will dash in, snatch a



THE END OF A FIGHT

"I always hoped some day to catch a photograph of a fight, but unfortunately I was never given any advance notices of an engagement, and even when I chanced to be present the affair was over in such a flash that this is the nearest I ever came. Growl, squeal, rush! The last I saw on the ground glass of the camera was a tumbling mass of brown. My developed plate showed this. Anagrammatically, fight had become flight. The interesting, even spacing of their positions tells a story—two flank movements converging to the center, instantaneous leap and rebound, and a simultaneous dash for cover."

bit of bread, and he gone before his clumsy, slow-thinking cousin has had time to move. "A jolly fine adventure that!" says the twinkle in his eyes (see page 91).

EVERY "MUNK" FOR HIMSELF

All of the beasts were jealous and selfish, trying to eat up everything from each other, like undisciplined children. Take Tiny and Big Chipmunk Bobby! Bobby was busy on a big pile of bread. Tiny was circling around, wanting so badly to join the feast, but afraid of masterful Bobby. I held out some bread to Tiny, who came for it at once. Bobby saw. Down fell the bit of bread he was eating and down came Bobby on all fours. He raced to my hand, gave my thumb an impatient jerk with his mouth, as if to say, "The idea! What do you mean by such conduct?" and, flinging about, raced at the already fleeing Tiny. Then back to my hand came Bobby and calmly finished every crumb, even those

which had fallen between my fingers, before he returned to the pile he had left.

Once I even suspected a big chipmunk of reasoning power. A gopher was sitting in my lap, eating. A big chipmunk started to come, too; but, upon seeing the gopher, whom he did not like, he refused. Indecisively he ambled around, plainly at a loss to know what to do. Abruptly he stopped and, I know without external reason, shrilled the alarm note of the chipmunk, which means "Danger near." With noisy scurrying, he ran just behind me, where he stopped quietly. Not so the poor gopher! With a terrified squeal and a mighty leap, he was gone. Whereupon the chipmunk climbed into my lap with complete unconcern.

The reactions of the individuals within each tribe toward one another are of interest. One, two, and even three among the gophers would stay peacefully at a pile of food; but these seemed to be definite in-



FRIENDS? EVIDENTLY, BECAUSE THE TAILS ARE SMOOTH AND RATLIKE

If they had not liked each other, the tails would have been fluffed out like bottle brushes and curling like twisting whips.

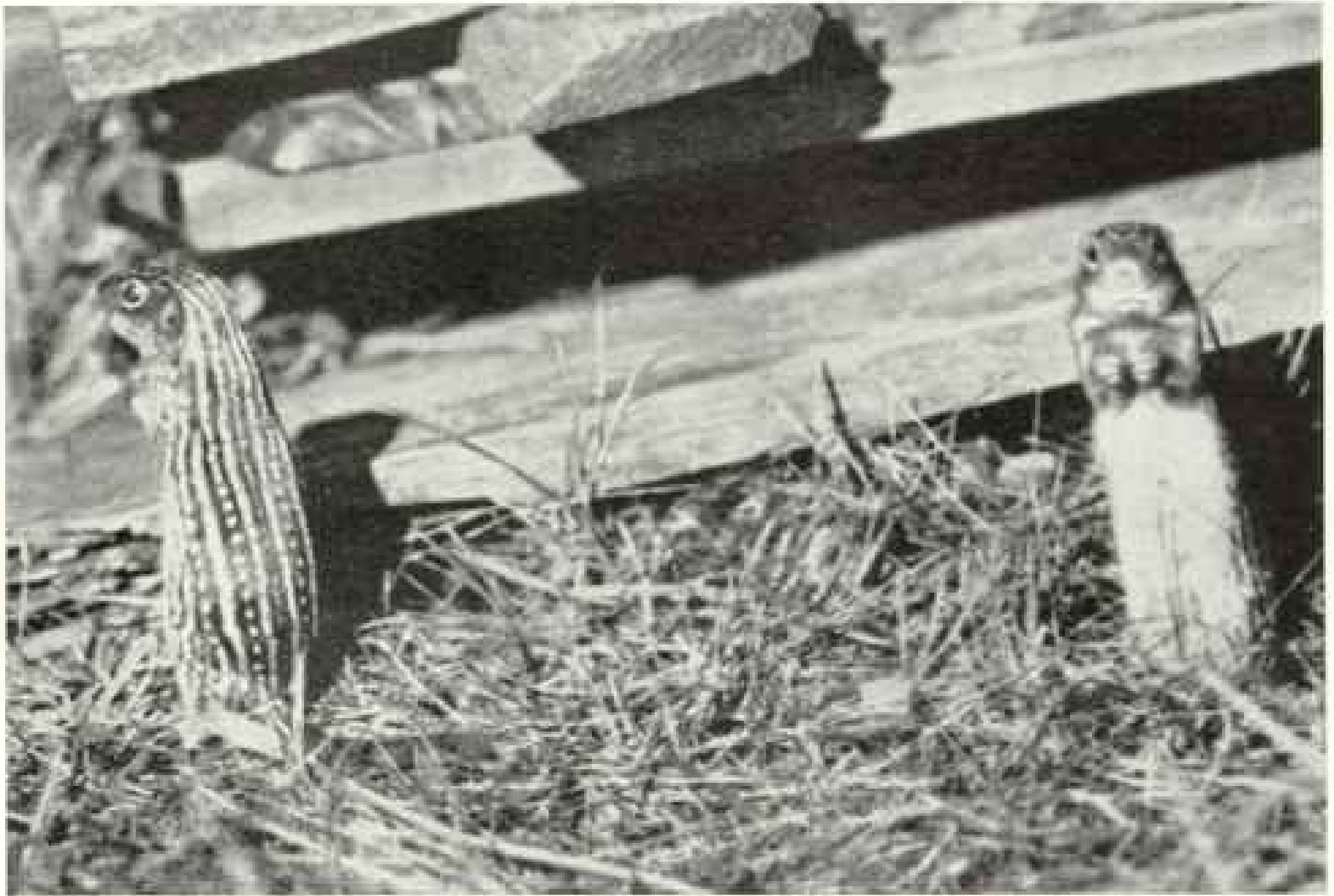
dividuals. Let some other than the right one draw near, and the one in possession of the feeding grounds would begin his growling and tail-switching. If the intruder ignored the warning, there would be a rush, a squeal, and a vigorous fight, which generally ended in the flight of both participants.

The big chipmunks acted the same, except that a lively chase took the place of the fight. The little chaps were not quite so belligerent, although there were always two that seemed friendlier toward each other, and always one or two that took possession of the food pile by divine right. The weaker always gave up to these aggressors. Apparently they had learned

they must. On the other hand, the little ones played and romped in a way I have never seen either of the others do. In passing, they often stopped for the merest flash of a second for friendly salutations, rubbing cheeks and noses together in blinking enjoyment (see pages 84-85).

PLAYING TRICKS ON THE AUTHOR

They loved to play tricks on me. Some days one might pretend to be most delighted to see me when I called, but when almost to me would start examining every familiar leaf and board and twig minutely. Sometimes he would even dig up some hidden morsel of food and come within a foot of me to eat the same thing I was offering.



TWO GOPHERS ACCOMMODATINGLY DEMONSTRATE BOTH SIDES OF THE QUESTION OF HOW A GOPHER REALLY LOOKS

I can see the mischievous twinkle in his eyes yet, as he did it. In time, with a careless scratch of a hind foot, he would come to nose the pieces in my hand, sampling one and then another, and finally, perhaps, making off with the biggest and crustiest. Yes, they'll pick the biggest every time, and it isn't accidental either.

If the scamp was full to his chin, a frolicking exploration might ensue—up my arm, to my shoulder, there to put little paws against my neck and stretch to sample my hair; then down my back, on my shoulder again, and then a great soaring leap to my head or hat. A man who could jump straight upward many times his height would reap a fortune, and yet in the land of the small chipmunk this is too common a phenomenon to notice. Their astonishing leaps resemble flying.

DEXTROUS TOILETS ARE MADE WITH
SPEED

Chipmunks are neat little souls. In the after-dinner clean-up they handle their hands with human dexterity. They lick them with rapid pink tongues and rub them swiftly over face and whiskers cat-fashion. They polish off their arms, grab their tails,

and lick them as they slip them rapidly through fingers and mouth. Then a little shaking jump into the air to dry off, perhaps; another rubdown and brush-off, a scratch, a flirt of the tail, and toilet is complete—all with lightning speed and beaming satisfaction.

Gophers and chipmunks live in the ground. Gopher entrances are easy to find, but the chipmunks hide theirs skillfully under stumps and bushes. One year, when I stayed after the first snowfall, these little holes where the chipmunks had burrowed out were very much in evidence. They did not relish the cold, and those that braved it hunted the top of a bare rock, where they huddled forlornly. The gophers disappear with the first cold weather.

One day I found a gopher lining his winter nest in frenzied haste. Around and around he would race until he found a dry tuft of grass. This he would seize in his mouth and tug and tug until he got it loose. It might come all at once and send him flopping, or one tough grass root might still hold persistently when he thought all were loose, and again he would be jerked backward in his mad rush. I put my dress over his hole, and then what a puzzled and dis-

tracted gopher he was! Around and over me he dashed, hunting frantically until I relented. The next day I found the hole filled solidly and smoothly. It had simply been a short cut to his work.

All small animals stand in deadly fear of the bloodsucking weasel. Summoned to the feeding station one morning by a violent, high-pitched squealing, I broke up a fight between a big chipmunk and a weasel. Another day, when I was feeding several gophers, a weasel, in the uncanny manner of the Cheshire cat, kept disappearing and reappearing from behind some near-by boards.

JAM AND CAKE RELISHED BY SMALL CHIPMUNKS

Not long after his final exit a gopher passed near the spot. He halted for an instant of frozen fear, his tail grew bottle-brushy, and with a squeal of panic he scuttled for home. A second gopher passed the place, and without a stop dropped the food he was carrying, let forth exactly the same shrill squeal, and was off. A third and a fourth repeated this performance, until I had no pets left, and for the rest of the morning I could call out neither chipmunks nor gophers.

Gophers eat anything, large chipmunks almost anything, but the small ones are quite fastidious. I usually gave them bread or crackers, with cake as a special treat. They are very fond of sweets. One little chap was so extravagantly fond of raspberry jam that whenever I put a bit on my finger he would clasp it so tightly and become so intent that I could make him walk along on his hind legs. How he would beam and how fast his little pink tongue would fly!

Both chipmunks and gophers lap water and milk like kittens. Their native food consists of all kinds of nuts, small grains, and seeds. The small ones (I have never seen a large one do it) swing among branches of the pin-cherry trees and the raspberry and blackberry bushes for the fruit. The pulp of this they very dextrously eliminate, as they extract the seeds.

Chaff from the timothy heads they discard in the same way, so neatly and so rapidly that as they eat it falls, like flowing whiskers, in an unbroken line until it drops in little heaps at their feet. How do they reach the timothy head, so high above

them? The gophers bite the head off neatly at the base and slip the stem through their hands, but the sprightly little chipmunks jump high and far above the center of balance of the stock and swing the head down by their own weight.

PEANUTS PROVE A NEW FOOD

They had to be taught to eat peanuts. The first time this food was proffered they merely sampled the outside. No good! I shelled some. These they rolled around, but still did not consider food. Finally, I broke them into bits. Ah-h-h! One chipmunk at last got the flavor. Delicious! After that he calmly refused bread and went around looking suggestively into all the empty shells. A few more days and they were all eating the new food with relish. By repeatedly shelling the nuts under their very noses, I finally taught them the full technique of peanut-eating. The gophers shelled and ate them at once. Greed rather than superiority is the answer to this, I think (see illustration, page 90).

It was most amusing to see the gophers and chipmunks fill their cheek pouches with food to be carried off and buried for winter use. They crammed it in, sometimes with one skillful hand, sometimes with both. If the peanut or the piece of bread did not fit, out it came with violent mouth contortions, to be replaced at a different angle. If still wrong, this corner and that was nibbled and smoothed off until the wearing became comfortable. Their cheeks swell out as big as their heads. In their haste to get all they can before some one interferes, they often bury their hoard near at hand in shallow holes, which they scratch up and recover with neatness and precision. I even saw one little fellow deliberately pick up a chip of wood and lay it carelessly over such a cache.

CAMERA FASCINATES CHIPMUNK SUBJECTS

The camera proved an endless source of excitement to my curious little pets. They of course tried to eat it. One fellow thoroughly enjoyed a novel trapeze act of his own invention. He would run up the slippery tripod legs and halfway up turn sideways, with all four feet planted together like an elephant on a tub. What his idea was I don't know, but it always ended in his going around and around on the slim



A BUSY MOMENT! THREE GUESTS AT ONCE—TWO SMALL CHIPMUNKS AND A GOPHER.

tripod leg for all the world like an acrobat. When I started to use a curtain-shutter camera, it was the favorite trick of one little fellow to jump upon the front board and dust off my lens with his tail. Perhaps I would be unaware of his presence until in the ground glass I would catch sight of a thin, wavering fuzziness, and there would be young scamperkins, on his hind legs, peering inquiringly into my face (see, also, page 82).

It is quite, quite hopeless to paint in words the merry twinkle of their eyes, the fascinating humanness and sauciness of their ways. To appreciate the joy of living that beams in their eyes, the happiness that they show when they come to know one and include one in the family, one must become acquainted with them personally—these furry brown children, with all the naive charm of childhood and the love of a good frolic.

INDEX FOR JANUARY-JUNE, 1931, VOLUME READY

Index for Volume LIX (January-June, 1931) of the NATIONAL GEOGRAPHIC MAGAZINE will be mailed upon request to members who preserve their copies and bind them as works of reference.

UNEARTHING AMERICA'S ANCIENT HISTORY

Investigation Suggests That the Maya May Have Designed the First Astronomical Observatory in the New World in Order to Cultivate Corn

BY SYLVANUS GRISWOLD MORLEY

Carnegie Institution of Washington

AUTHOR OF "THE FOREMOST INTELLECTUAL ACHIEVEMENT OF ANCIENT AMERICA," "CHICHEN ITZÁ, AN ANCIENT AMERICAN MECCA," ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

ARCHEOLOGY and history may be compared to father and son, the former being parent of the latter. Archeology brings man's record forward from the remotest past to the dawn of history. History carries on this story through written records—hieroglyphic inscriptions, cuneiform tablets, papyri, codices, chronicles, books, and documents of every description—down to the present day. The former begins when man as a species had become a biologic fact, five hundred thousand, a million years ago; the latter, involving written records, is not more than seven thousand years old at the outside, the closing chapter only in the story as a whole.

AMERICAN SCIENTIFIC AGENCIES STUDY AMERICAN ARCHEOLOGY

It has not been so many years since the older generation of classical archeologists denied that we had any pre-Columbian history in America and only grudgingly conceded us a very meager archeology. A few clay pots and cooking vessels, flint arrow points, bone awls, and stone implements summarized the cultural achievements of the American Indian. The civilizations of two continents were dismissed with the slighting designation "Stone Age," while, in contrast, the Old World was declared to be the center of all art and learning.

Still another and earlier group of archeologists, certainly with a truer perception of the importance of the aboriginal American contribution to the story of mankind, sought to derive our native civilizations from some Old World origin. The ancient Egyptians, Phoenicians, Cambodians, and Javanese, the Ten Lost Tribes of Israel, even the fabled folk of shadowy Atlantis, have been hailed at one time or

another as the ancestors of the American Indian. Inaccurate, not to say fantastic, as these theories are now known to have been, their proponents at least had the merit of recognizing that brilliant civilizations had flourished on this continent long before the coming of the white man.

Happily, both these points of view concerning our distinguished past, each erring in a different direction, are now obsolete, both having been relegated to the limbo of lost causes by the progress of modern scientific investigation, and we are now in a position to write at least some of the later chapters of ancient American history.

American institutions have taken the leading part in developing the scientific study of American archeology. The Peabody Museum of Harvard University was the pioneer in this field, having begun its investigations more than half a century ago. Now, however, many large scientific institutions send expeditions to all parts of the Americas for gathering information and material from which the facts of our ancient history are gradually being reconstructed.

Aside from the governments of Argentina, Brazil, Chile, Guatemala, Mexico, Peru, and the United States, all of which carry on archeological investigations in their own countries, an even larger number of private organizations are operating in the same field.

NEW WORLD CIVILIZATIONS WERE BASED UPON CORN

These various scientific agencies, through expeditions, explorations, and excavations, have during the past fifty years amassed a considerable body of information, until it is now beginning to be possible, here and there, at least to block in the background of the ancient American picture.



CLAY EFFIGIES FROM BELOW THE PLAZA FLOOR OF GROUP E, AT UAXACTUN

They are pre-Maya in type and somewhat resemble similar archaic figurines, probably of greater age, from the highlands of Mexico and Guatemala. This find lay directly below the most ancient known specimen of Maya architecture (see text, page 113) and may therefore furnish evidence for connecting the Maya civilization with the early cultures from which it was supposed to have sprung.

The agricultural foundation of our native American civilizations is now an accepted archeologic fact. Just as rice is the food staple of Asia, and wheat of Europe, so in ancient times Indian corn, the *Zea mays* of botany, was the food staple of America—indeed, among the Indian races it still continues to be the staff of life. Hence, where corn was first cultivated, there flourished our first high native civilization.

But the botanists, except for agreeing that corn is an American product, are far from united as to where it originated. Two lines of investigation have been followed in seeking the answer to this question. One points to a South American origin; the other indicates North America as the most probable center of distribution. One group claims that corn originated where the greatest specialization of the cereal occurs, where the greatest number and diversity of types are found. If this be accepted as the criterion of origin, then we need seek no further, since Peru has more kinds of corn, even including a fossilized ear, than any other part of the New World.*

A second group, the members of which

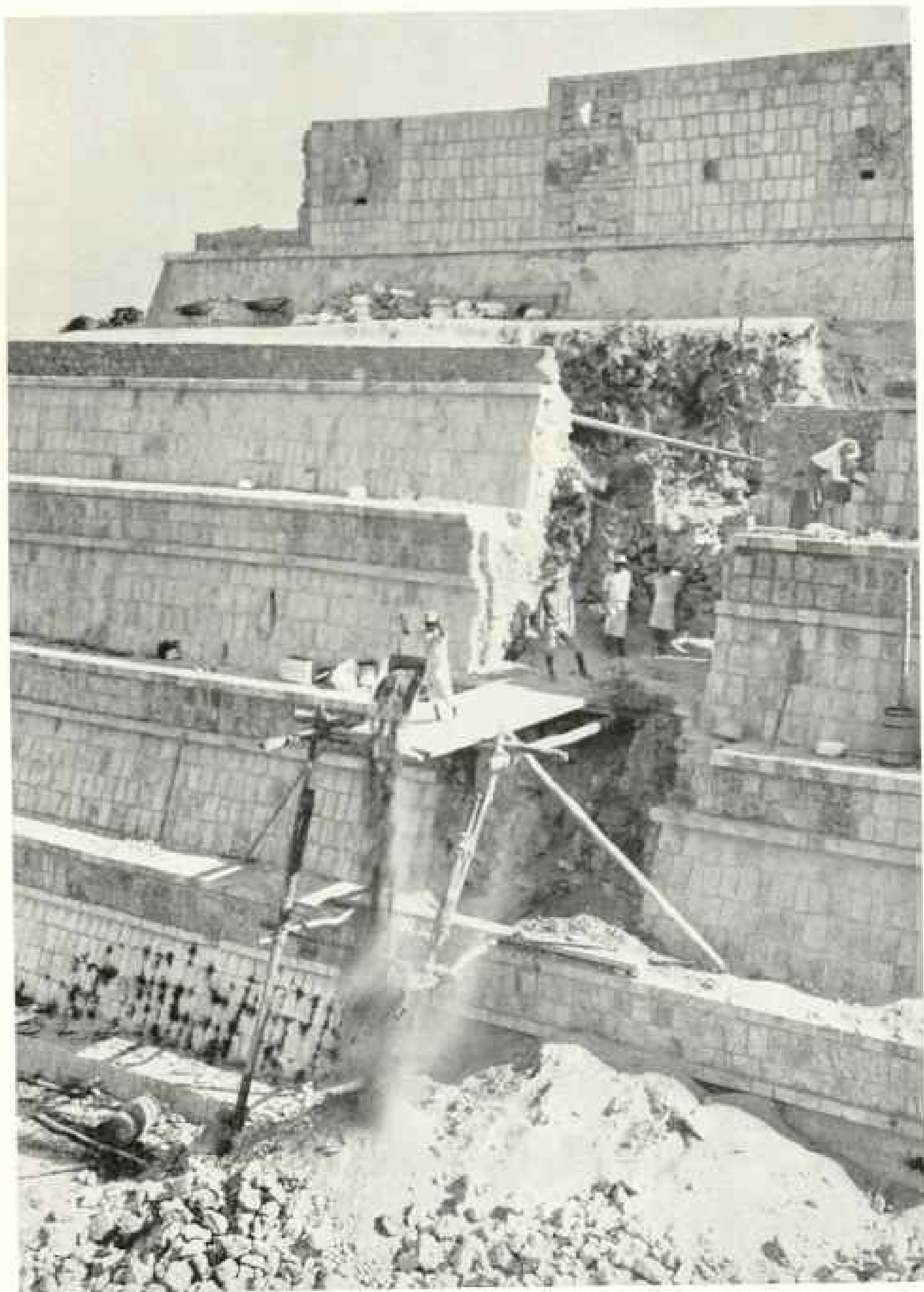
* See, also, "Staircase Farms of the Ancient Peruvians," by O. F. Cook, in the NATIONAL GEOGRAPHIC MAGAZINE for May, 1916.

may perhaps be called the modernists of botany, hold a different view. They stress the importance of another factor: Where are the nearest relatives of corn to be found? Judged on this basis, corn must have originated somewhere in the highlands of Mexico, since here is the home of *teosinta*, the only wild grass which is known to cross with corn, the pollen of either fertilizing the other, thus giving rise to various hybrid types.

As between these two places of origin for the American food staple, the archeologist favors the latter because of the time element involved.

The older school, who may be called the fundamentalists of botany, believe that corn was developed slowly, through a very long period of time, possibly several hundred thousand years, from some wild grass, by minute changes in the characteristics of the successive generations, and that the hand of man appeared in the later stages of this long evolutionary process. The other group, however, hold that corn came into being as a hybrid between *teosinte*, or one of its close relatives, and some as yet unknown, or at least unidentified, wild grass.

This latter hypothesis has much more in its favor from the archeological point



EATING AND PRESERVING AN ARCHEOLOGICAL CAKE AT THE SAME TIME

The task of excavating the Temple of the Warriors at Chichen Itzà was complicated by the discovery of a still earlier temple inside the supporting pyramid. The buried temple was cleared of its rubble masonry fill and, to prevent collapse from the enormous weight of the Temple of the Warriors, supports were provided over the excavated chambers (see text, page 121, and illustration, page 126).



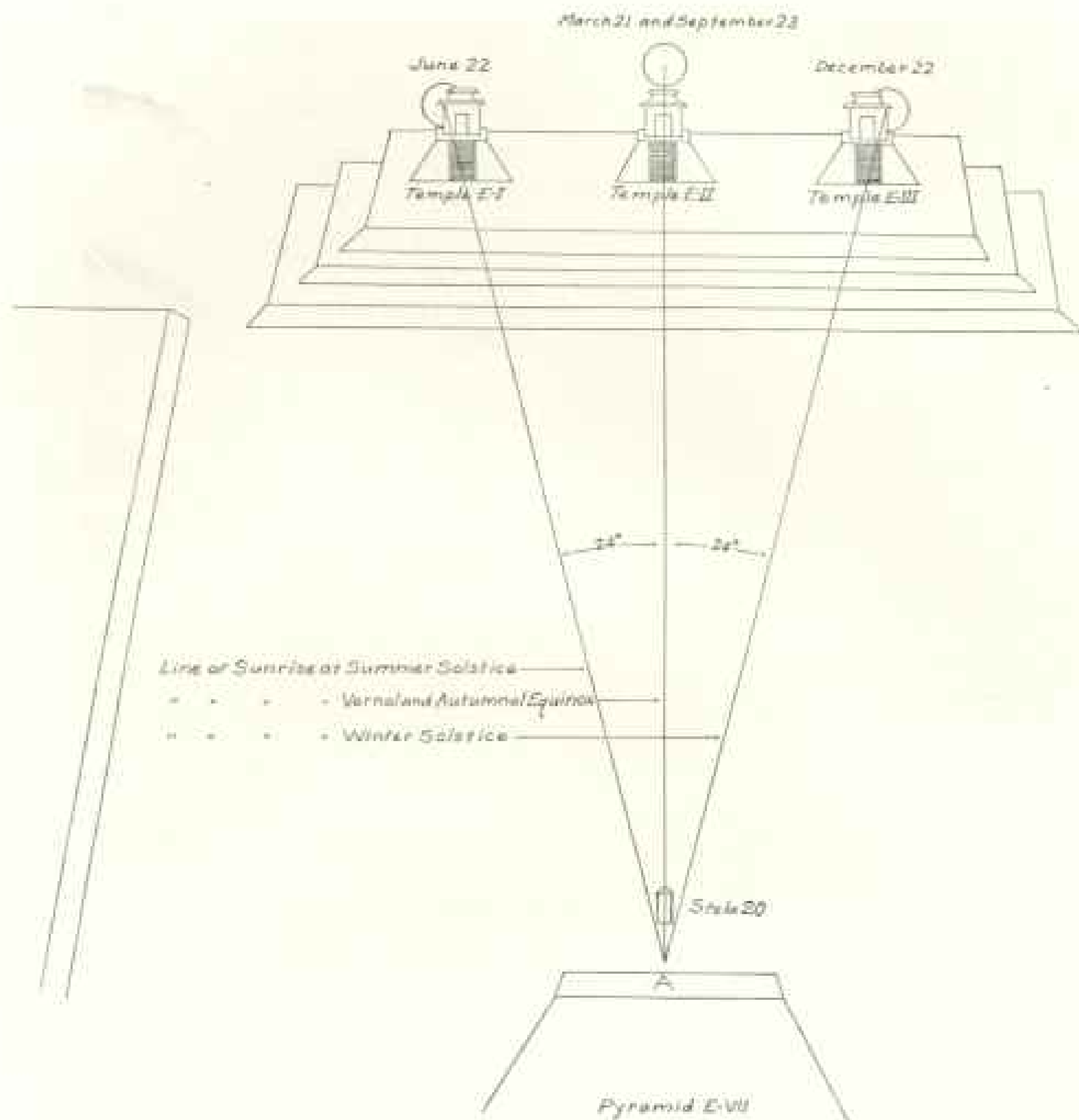
PAY DAY AT CHICHEN ITZÁ

Native Maya waiting for the fortnightly pay roll. The men work, for the most part, in the henequen fields, the women in the home, and all memory of their former greatness, their cities, temples, and pyramids, their arts and sciences, has been blotted out.



THE VEGETABLE GARDEN, THE PRIDE OF THE PLANTATION

The Korean gardener at Chichen Itzá wages ceaseless warfare against leaf-cutter ants, vultures, blackbirds, locusts, bees, iguanas, and what not, which threaten literally to carry off the produce of his garden. In spite of ten times the number of plagues which harassed Egypt, some prize vegetables have been raised here—radishes 14 inches long, cabbage heads a yard wide, and papayas weighing from 12 to 15 pounds.



THE FIRST ASTRONOMICAL OBSERVATORY IN AMERICA (SEE, ALSO, PAGE 105)

The diagram shows the arrangement at Temples E-I, E-II, E-III, Pyramid E-VII, and Stela 20, at Uaxactun, which fixed the positions of the equinoxes and solstices in the year for the inhabitants of the city. As observed from A, on the medial line of the stairway ascending Pyramid E-VII, directly behind Stela 20, the sun rose behind the left front corner of Temple E-I on June 22; behind the middle of Temple E-II on March 21, and again on September 23; and behind the right front corner of Temple E-III on December 22, thus fixing the positions of the summer solstice, the vernal and autumnal equinoxes, and the winter solstice, respectively (see, also, text, page 114).

of view than the former, since it requires much less time to have come about. Its supporters would be satisfied with ten thousand years or so, possibly even less if put to it, since this period of time very much better agrees with the generally accepted archeological view, that the American continents were peopled some ten to twenty thousand years ago by successive waves of migration from northeastern

Asia. There are very few archeologists, indeed, who are willing to concede anything like several hundred thousand years for the antiquity of man in the Americas.

CORN PROBABLY DEVELOPED IN MEXICO

All things considered, it is not improbable that the priceless cereal which was to change so fundamentally the conditions of living in the two Americas, which was to



A MAGNIFICENT EXAMPLE OF ABORIGINAL AMERICAN ARCHITECTURE AT UAXACTUN

Pyramid E-VII is 25 feet high and about 70 feet square and faces east. Directly in front (extreme left) stands Stela 20, dating from A. D. 235 (see, also, diagram, page 104). The northern stairway, with two pairs of flanking masks, shows here. "Worn by time and the inroads of the jungle to a peaked mass of crumbling stone," this gigantic piece of sculpture is one of the most remarkable monuments left by the "Greeks of the New World" (see, also, text, page 115).

make possible the growth of our great indigenous empires—the Inca, the Maya, the Toltec, and the Aztec—was developed somewhere in the highlands of central Mexico, from an accidental cross between teosinte and some as yet unidentified wild grass, some time during the last ten thousand years.

Once this discovery had been made, the panorama of human activity began to change rapidly. Before the advent of corn man had been a hunter and a fisherman, living by the chance supply of game and fish from forest and stream, eked out by such wild fruits, berries, roots, and nuts as experience, the well-known process of trial and error, had proved would not injure him.

Living in this casual hand-to-mouth way, always but one lap ahead of starvation, the social units were necessarily limited to very small groups, perhaps at first to not more than a few families, united by ties of blood. When a region was hunted over and fished out, the group moved elsewhere

in the enormous stretches of unoccupied land. Personal possessions were limited to a few trinkets, such as arrow points and bone tools, and property, in the sense of real estate, was probably nonexistent, except, perhaps, for shadowy rights to this patch of forest or that reach of stream.

After the development of corn, however, a vast change in living conditions gradually came about. Agriculture demanded fixed abodes. Fields had to be cleared for planting, to be sowed and kept weeded, and finally the crops had to be harvested. More and more time was devoted to agriculture and less to moving about. Homes had to be maintained in the immediate vicinity of the tillable lands. Man ceased to be a wanderer and at last settled down to live in fixed places, which, as time went by, grew larger and larger.

It would carry us too far afield even to outline here the major changes in man's social conditions which the introduction of agriculture made possible. The story of civilization the world over, human achieve-



NATURAL ICE IN THE TROPICS

A ball of hailstones after a great storm on April 14, 1925. In sheltered places near Chichen Itzá the ice lasted for 24 hours after it had fallen.

ments in art, architecture, literature, industry, government, social relations, religion and science, in every field of man's activity, together constitute the record.

The introduction of agriculture was probably followed by the invention of pottery. Then some one discovered how thread could be made from cotton, and hand-loom weaving came into being.

A whole new pantheon gradually developed out of the current conceptions of crop germination and fertility; new rites and ceremonies were devised for the propitiation of deities who controlled the weather—the sun, rain, and wind gods; a new religion was born. Soon the need for sanctuaries to house the idols representing these

various deities gave rise to architecture in a more formal sense, something beyond a mere thatched hut for the business of everyday living.

Thus, slowly, with infinite toil and many false steps, man began his long, long climb from the brute state to Parnassus.

AMERICA'S EARLIEST EXAMPLE OF FORMAL ARCHITECTURE

Perhaps the earliest example of formal architecture in America is the Pyramid of Cuicuilco, on the outskirts of the village of San Fernando, a suburb of the town of Tlalpam, 12 miles south of Mexico City. It was discovered by Dr. Manuel Gamio, for many years Director of Archeology for the Government of Mexico. Proof of its antiquity fortunately rests not on the disputed battle grounds of archeology, such as the relative sequences of pottery types, archi-

tectural development, and such bases, but upon the more impressive foundation of geology.

The Pyramid of Cuicuilco was originally 52 feet in height and 412 feet in diameter, and its sides were covered with unworked stone. Some time after it had fallen into disuse, as indicated by a considerable accumulation of debris at the base, a volcanic eruption from Xitli, one of the craters of Mount Ajusco, 10 miles southwest of Cuicuilco, loosed a flood of lava over the adjoining parts of the valley. This flow completely encircled the Pyramid of Cuicuilco, burying its base to a depth of about 25 feet. The upper part projects like an island from a sea of lava.

Here, then, is indisputable geologic proof that the pyramid was older than the lava flow.

Recognizing the fundamental importance of this at least geologically dated pyramid, the National Geographic Society carried on excavations here for two years under Dr. Byron Cummings, of the University of Arizona,* and also sent Dr. N. H. Darton, of the United States Geological Survey, to study the geological evidence. While it was naturally impossible to assign anything like a definite date for this lava flow, the writer understands that Doctor Darton is inclined to place it between three and four thousand years ago. A pyramid four, or even only three, thousand years old bids fair to be our earliest example of American architecture.

The antiquity of the Pyramid of Cuicuilco was further authenticated by the discovery of an archaic cemetery buried under the same lava flow, but on the opposite side, near the village of San Ángel. Some time before Xitli poured its molten rock over this part of the Valley of Mexico, there had been a prehistoric cemetery on the edge of what is now the modern village of San Ángel. Here, in the coarse gravel just under the surface, lay skeletons of these early Americans, perhaps related to the builders of Cuicuilco, sur-

* See, also, "Ruins of Cuicuilco May Revolutionize Our History of Ancient America," by Byron Cummings, in the NATIONAL GEOGRAPHIC MAGAZINE for August, 1923.



A JAGUAR WHICH NEARLY GOT HER MAN

The American jaguar almost never attacks man, but the female shown here was very nearly a fatal exception. Two Indians, hunting near Chichen Itzá, came upon the cat, which leaped toward them. One fired twice, registering a hit each time, but before he could fire again the cat was upon him, clawing at his face. Finally, his companion succeeded in dispatching the beast at close range, but not until the man who was down had had his arms badly gashed.

rounded by their simple utensils—bowls, pots and dishes of baked clay, obsidian knives—and little baked clay figurines, which were probably the very agricultural fetishes with which they sought to protect their fields and ward off evil in the second millennium B. C.

MAYA CIVILIZATION THE PEAK OF ANCIENT AMERICAN CULTURE

These archaic peoples of central Mexico may have been the earliest users of corn as a food, and perhaps were the first to set



THE WRECK OF THE STAFF'S AUTOMOBILE

The car was exposed to the hailstorm (see, also, page 106) and came through without injury other than the damage to the top.

foot on the long trail leading from savagery to a civilized state.

Although some tribe or group of central Mexico was probably the first to raise corn, it did not develop our highest native civilization. At that remote time there probably lived on the Gulf coast plain of Mexico small groups of nomadic folk, the Maya, speaking a common language. Gradually, from the highlands to the west, there crept down through the foothills rumors of the wonderful new food plant which was so vitally changing the way and manner of living. Finally some of the precious grain itself reached the coast plain. Here, where a deep alluvial soil, a continuously warm climate, and a heavy rainfall combined to create a natural hothouse, the planting of the new cereal yielded maximum results with a minimum of effort.

Soon food reserves in such quantities as never before had been thought possible began to be accumulated. The priests and medicine men saw that the new food was good. The time of more and more men could be, and was, withdrawn from the mere business of keeping body and

soul together and was applied to creative labor in other lines.

Because the Maya were primarily agriculturists and because the civilization they were developing was founded on the cultivation of corn, the priests very early turned their attention to the measurement of time in its various manifestations. How long was the year? How long the waxing and waning of the moon? How long shone the morning star in the east, how long the evening star in the west? Astronomy, or, better, astrology, became their chief concern, and the recording of its principal visible phenomena their most important occupation.

THE MAYA REACH HISTORY'S THRESHOLD

Perhaps as early as the beginning of the first millennium B. C. a number of time periods, especially the lengths of the year and of a lunation, had been accurately measured. Now the invention of a calendar and chronology became pressing needs—some system for keeping account of the passing days, some form of writing with which to record the pageant of events. The calendar, chronology, and the



Photograph by E. L. Caudall

WASHING DAY IN A MAYA VILLAGE

The tub is a shallow wooden basin, hollowed from a section of a tree, with a flat projection on which the clothes may be scrubbed.

science of writing were successively developed. The Maya had reached the threshold of history.

All material achievements prior to the invention of writing had been reduced by time, the universal solvent, to the unintelligible remains of other days, the speculative subject-matter of archeology; but now the Maya had provided themselves with a means of bridging time, of passing on to posterity written record of what had been.

To be sure, these records are very simple, scarcely more than brief references to the principal astronomic phenomena of the time, with the attendant religious ceremonies appropriate to each, and possibly abbreviated allusions to current historical events. But, however concise these references may be, they deal, nevertheless, with the subject-matter of history, a record of current events, the first ever kept on the American Continent. The birth of New World history was at hand.

From this point on, the Maya story sweeps forward majestically. As early as the beginning of the Christian Era they

seem to have moved southeastward, into the great forests of what is now northern Guatemala, and to have begun the intensive occupation of this region. Cities grew up here and there; great pyramids of cut stone surmounted by lofty temples were built around the sides of paved courts and plazas, not by tens and twenties, but literally by hundreds.

"THE GREEKS OF THE NEW WORLD"

Richly sculptured monuments were erected in these courts and plazas at intervals of 1,800 days, stone almanacs, whereon were inscribed in hieroglyphic writing the principal astronomic and possibly historical events of the preceding 5-year period. Temples and palaces were not only elaborately sculptured, but also brilliantly painted. Wood-carving, jade-cutting, leather-work, pottery-making, weaving, painting, a host of minor arts and crafts, kept pace with the stupendous development in architecture.

These spectacular attainments in different fields amply justify the characterization first applied to the Maya by the writer



Photograph by Col. Charles A. Lindbergh

AN AIR VIEW OF CHICHEN ITZÁ, THE MECCA OF THE MAYA WORLD

In the left center foreground is the *Monjas*, probably the palace of the Itzán rulers; beyond it is the *Caracol*, or Astronomical Observatory, a circular tower on a rectangular base (see page 113). The *Red House*, a temple with a red band running around the antechamber, is at the extreme left, and above it is the *Ball Court*, where a game similar to modern basket-ball was played. In the upper center is the *Castillo*, and to the right the *Temple of the Warriors*. In the right foreground is the *Akab'tzib*, or House of the Dark Writing.



A BIRD'S-EYE VIEW OF THE NORTH COLONNADÉ AFTER EXCAVATION

This splendid hall is 465 feet long, including the unfinished eastern end. When it and the other units of the group have been cleared and repaired, the whole will take its place among the greatest pre-Columbian architectural wonders of the New World (see, also, text, page 120).



Photograph by Raoul Camera

A TEMPLE TO THE MAYA ZEUS

The so-called Castillo at Chichen Itzá (see, also, illustration, page 110) is not a castle at all, but the principal temple of Kukulcan, the Feathered Serpent, patron deity of the city. It covers an acre of ground and towers more than 100 feet above the level of the broad plaza at its base. Four balustraded stairways ascend its terraced sides, and the sanctuary on the summit is entered through a doorway flanked by feathered-serpent columns. The windmill showing at the right of the summit belongs to the water-supply system of a Mexican camp a few hundred yards away. Its workers are repairing the Castillo under direction of the Mexican Government.

several years ago—"The Greeks of the New World."*

This first period of Maya florescence in northern Guatemala has been called the Old Empire. It came to an end probably through the operation of an age-old economic law—"the high cost of living"—the failure of their agricultural system to supply sufficient crops to meet the ever-growing needs of the increasing population.

Probably as early as the third century of the Christian Era the Peninsula of Yucatan had been discovered by pioneers pushing out from the northern centers of the Old Empire, and by the fifth or sixth century the occupation of the new land

was already well under way. Finally, by the end of the seventh century, the Old Empire had been generally abandoned and the New Empire (the Peninsula of Yucatan) colonized.

THE METROPOLIS OF THE NEW EMPIRE

The Maya in their new homes reached a second period of brilliance in the 11th to 14th centuries. Architecture, for example, reached a development never before attained. Chichen Itzá became the metropolis of the New Empire—indeed, the Mecca of the Maya world—a city to which pilgrimages were made from distant parts of the peninsula.*

But the end was near at hand. During the 15th century a devastating civil war

* See, also, "The Foremost Intellectual Achievement of Ancient America: The Hieroglyphic Inscriptions on the Monuments in the Ruined Cities of Mexico, Guatemala, and Honduras Are Yielding the Secrets of the Maya Civilization," by Sylvanus Griswold Morley, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1922.

* See, also, in the NATIONAL GEOGRAPHIC MAGAZINE, "The Home of a Forgotten Race—Mysterious Chichen Itzá, in Yucatan, Mexico," by Edward H. Thompson, June, 1914; and "Chichen Itzá, an Ancient American Mecca," by Sylvanus Griswold Morley, January, 1925.



REPAIRING THE CARACOL, OR ASTRONOMICAL OBSERVATORY, AT CHICHEN ITZÁ

In ancient times the dates of the principal astronomic phenomena in which the Maya were interested—equinoxes, solstices, phases of Venus and of the moon, and eclipses—may have been determined here. (See, also, pages 104 and 105.)

so weakened the Maya that when the Spaniards arrived, a hundred years later, the warring remnants of this once great people fell an easy victim to the shock of foreign conquest.

UAXACTUN, THE OLDEST MAYA CITY

On May 6, 1916, the Second Central American Expedition of the Carnegie Institution of Washington discovered the ruined city of Uaxactun (pronounced wa-shock-tune), deeply buried in the jungles of northern Guatemala. The site is located four days' mule journey from El Cayo, the head of navigation on the Belize River, in British Honduras, and twice that time during the rainy season, when great sections

of the forest are flooded and converted into bottomless swamps.

Uaxactun is not as large as a number of other Old Empire cities, but its peculiar importance lies in the fact that it contains the oldest dated monuments to be found anywhere in the Maya area, antedating any others by more than three-quarters of a century.

Most monuments of the Old Empire were erected in Baktun 9 of the Maya chronological era, a period extending from A. D. 176 to A. D. 571; but this earliest monument at Uaxactun, to which the designation Stela 9 has been given, dates from Baktun 8—*i. e.*, 8.14.10.13.15 of the Maya Era, or A. D. 68.



COPYING FRESCOES AND SCULPTURED PAINTED COLUMNS

Staff artists, Jean Charlot and Mrs. Ann Axtell Morris, made detailed sketches in the outer chamber of the buried temple, where frescoes and colored bas-reliefs present the most notable examples of Maya painting which have survived the ravages of time (see, also, text, page 123).

The writer will never forget the day he discovered this oldest Maya monument, standing in its lonely court on the Acropolis of Uaxactun. As he came through the thick bush he caught sight of the tall shaft of stone leaning far to one side, with two columns of hieroglyphics engraved upon its back, so covered with dried moss and living lichens as to be all but indistinguishable.

Climbing up the back of the shaft, he fell to work with a hard-bristle scrubbing brush, cleaning off the dried moss which obscured the details of the inscription. Suddenly there literally flashed from the stone the number 8—three dots and one bar, as the ancient Maya wrote it—and beside it the sign for the baktun.

Because this monument records a date in the Maya Baktun 8, the name Uaxactun was given to the city, the word meaning in Maya *uaxac*, "eight," and *tun*, "stone"—i. e., stone eight. And several years later, when the Carnegie Institution selected an Old Empire city for extensive study and excavation, Uaxactun was

chosen, because, on the basis of the dated monuments, it is the oldest center of the Maya civilization.

THE OLDEST ASTRONOMICAL OBSERVATORY IN AMERICA

Frans Blom, of the Seventh Central American Expedition, in 1924, discovered that the arrangement of temples and pyramids on the east and west sides of the plaza of Group E, probably the oldest part of Uaxactun, formed a sort of giant sundial for determining the positions of the equinoxes and solstices in the year.

The operation of this primitive astronomical observatory seems to have been as follows (see the diagram on page 104): The point of observation was on the medial line of the stairway ascending Pyramid E-VII, directly behind Stela 20, on the west side of the plaza. On March 21, the day of the vernal equinox, the sun, as observed from the stairway of Pyramid E-VII, was seen to rise directly behind the middle of Temple E-II, the middle one of the three temples on the east side



UNEARTHING AN ALTAR

Earl H. Morris, who was in charge of the excavation and repair of the Temple of the Warriors, is on the trail of buried archeological treasure. (See, also, illustrations, pages 124 and 125.)

of the plaza. As the spring changed into summer the sun rose farther and farther to the north until, on June 22, the day of the summer solstice, it rose directly behind the northernmost front corner of Temple E-I, the northernmost of the row of three temples on the east side.

As summer merged into early fall the sunrises crept southward until, on September 23, the day of the autumnal equinox, the sun rose again directly behind the middle of Temple E-II. Finally, as fall passed again into winter, the sun rose farther and farther to the south until, on December 22, the day of the winter solstice, it was coming up directly behind the southernmost front corner of Temple E-III, the southernmost of the row of three temples on the east side.

Temples E-I, E-II, E-III, and Pyramid E-VII were so arranged that by observing the sunrises from the last the priests of Uaxactun were able to tell the inhabitants of the city when the equinoxes and solstices fell. This information was used by the agricultural population of the surrounding country in regulating the dif-

ferent activities of their agricultural year, the felling and burning of the bush, planting and harvesting, with the ceremonies appropriate to each occasion.

THE OLDEST KNOWN CONSTRUCTION IN THE MAYA AREA

Mr. O. G. Ricketson, Jr., in charge of the Tenth Central American Expedition, began the excavation of Pyramid E-VII in 1927. It would be difficult to imagine a less promising mound than this pyramid presented at that time. It appeared to be a sharply pointed hill built of rough rubble, 50 feet high and, roughly, 80 feet square at the base. There was not a cut stone, either fallen or in position, on any of its sides and the whole was covered with the exuberant growth of the tropical forest.

A trench, sunk through this rubble coating to a depth of two yards below the surface of the mound, most unexpectedly brought to light the remains of an earlier stucco-covered construction. As shovels and picks laboriously removed the outer covering of rough, unworked stones, there



"AN UNPROMISING PILE OF STONE TRANSFORMED INTO AN IMPRESSIVE AND LASTING MONUMENT"

The Temple of the Warriors is the most imposing structure excavated at Chichen Itzá. From a state of almost hopeless ruin it has been restored in a manner worthy of its original importance (see illustrations of details, pages 118 and 126).



THE ARCADE UNDER THE NORTH COLONNADÉ, AT THE GROUP OF THE THOUSAND COLUMNS, BEFORE AND AFTER EXCAVATION
 At the left the green mantle of forest has covered the ruin since Chichen Itzá was abandoned, in the middle of the 15th century. A more detailed view of the vast architectural complex of the Thousand Columns is shown on page 111.



A FEATHERED-SERPENT COLUMN DOORWAY

The photograph shows columns 15 feet high in course of reconstruction, before the Temple of the Warriors proper had been completely excavated (see, also, text, page 122).

stood forth, clearer and clearer day by day, what is unquestionably one of the most magnificent examples of aboriginal American architecture extant—a silvery white, stucco-covered pyramid of exquisite proportions and perfect outline (see page 105).

The earlier construction is 25 feet high and about 70 feet square at the base. It rises in a series of five receding terraces and is ascended by four principal stairways, one on each side, although the only one which goes to the summit is that on the front, or west face.

These stairways are flanked with pairs of great grotesque stucco masks, each 8

feet square. The upper ones represent enormous human faces with slitlike eyes, large bulbous noses, filed teeth, and lolling tongues. The lower masks seem to be highly conventionalized serpent heads.

No building was found on the summit, and it is thought this pyramid must have been used for the celebration of rites and ceremonies, possibly sacrifices, dances, *et cetera*, which it was desired to hold in the public view.

As it stands there, practically as complete as the day it was buried by the ancient Maya themselves, 2,000 years ago, it presents a never-to-be-forgotten picture. The deep-blue sky above and the equally deep-green forest behind make a spectacular setting for this architectural gem.

EXCAVATIONS CONFIRM ANTIQUITY OF STUCCO PYRAMID

Excavations during the 1928 field season, carried on by Dr. George C. Vaillant, of the American Museum of Natural History, below the floor level of this same plaza, brought startling confirmation of the remote antiquity of this stucco-covered pyramid.

Below the top floor level three earlier floor levels were found, the total depth from the upper floor to the undisturbed soil beneath being 8 feet. Wherever trenches were sunk into this 8-foot stratum of artificial accumulation, the debris of human occupation, exceedingly early ceramic types were found—pottery vessels of primitive shape and simple decoration, baked clay effigy whistles and gro-

tesque human figurines strongly recalling similar objects from the Archaic Period found in the highlands of Guatemala and central Mexico (see page 100).

It was established that the top floor had been built at the same time the original stucco-covered pyramid had been incased within the later rubble pyramid. Dated monuments associated with this last floor level seem to indicate that these alterations had been made about A. D. 100. The stucco pyramid which was associated with the lowest floor level is therefore prior to that date; perhaps the estimate of its age given above—*i. e.*, 2,000 years in round numbers—is not far astray either way.

At this early date the Maya had not yet developed the distinctive characteristics of their art and architecture. This very early pyramid is distinctly pre-Maya in feeling, as if it had been erected before Maya architecture had come into being, or at least was only just beginning. Its style, as well as the archaic character of the pottery and clay figurines found associated with it, and, finally, the early date of the monuments in this plaza, all indicate that this stucco pyramid is the earliest example of Maya architecture yet discovered.

CHICHEN ITZÁ, LARGEST CENTER OF THE NEW EMPIRE

The same reason which led to the selection of Uaxactun as the most promising site for excavation in the Old Empire—*i. e.*, because of its greater antiquity, as shown by its dated monuments—led to the



A HUMAN HEAD EMERGING FROM A SERPENT'S JAW

It has been suggested that this may have been a graphic way of visualizing the idea of the soul of the deity or mythological figure thus represented.

selection of Chichen Itzá, the oldest city of the New Empire, as the most promising center for intensive study in Yucatan.

Excavations were begun at Chichen Itzá in 1924 (see, also, text, page 112). During the last few years digging has centered at the Group of the Thousand Columns, so named because the round column with a square capital is the principal architectural feature of this part of the city.

This group is built on a great artificial terrace covering some 45 acres, its various temples, colonnades, ball courts, and market place covering 27 acres. The foundation terrace is built directly on the rolling, uneven surface of the ground and



A FREAK OF EXCAVATION AT CHICHEN ITZÁ

After the roof of this colonnade collapsed, filling the building to about the level of the tops of the columns, a forest grew over it. Excavation has left the stump of this tree clinging by its roots to the top of a column, suspended between heaven and earth, like Mohammed's coffin. Maya roof construction was the weakest feature in their buildings (see, also, text below).

varies in thickness from 2 to 15 feet, according to the inequalities of the surface. The top is level and originally had been finished with a floor of hard lime plaster, which has almost entirely disappeared.

The principal units forming the group are arranged around the sides of a spacious plaza, the Court of the Thousand Columns, which measures 400 feet on a side. None of these buildings is directly on the floor level of the court, all rising from platforms of varying height.

The North Colonnade extends across the north side of the court. It is a splen-

did hall, 465 feet long including the unfinished eastern end, 56 feet wide, and originally about 20 feet in height. The completed section contains 176 columns, and against the back wall there is a sculptured dais, possibly even a throne. This is $16\frac{1}{4}$ feet long, 13 feet wide, and just under a yard in height. The sides are beautifully sculptured and painted with a procession of warriors, the eyes of which are made of inlays of white shell, with pupils of some vegetable pitch mixed with charcoal to make them black. The cornice of the dais is composed of intertwining rattlesnakes decorated with plumes.

In front of the dais stands the statue of a reclining human figure, the so-called Chac Mool, twelve of which have been found at Chichen Itzá. The figure reclines on its back, with the knees drawn up, and the head is turned to one side; on the abdomen rests a plate, held by the hands. This type of statue seems to have

been placed not only before these daises, but also in front of the temples themselves. They were probably for burning incense or for holding offerings made by the faithful to the gods.

The excavation of this colonnade revealed the fact that even in ancient times, before the city was abandoned, some of the columns supporting the enormously heavy roof of solid masonry threatened to collapse. At least four of the columns were incased in masonry piers, as if their drums had begun to give way under the strain and had to be bolstered up in this

way. Roof troubles must have been a constant source of worry to the priesthood at Chichen Itzá, since these great colonnaded halls were always threatening to cave in.

The buildings on the east, south, and west sides of the Court of the Thousand Columns, consisting of other colonnades, pyramids, and temples, yet remain to be excavated; but when this great inclosure has been completely cleared and its different architectural units repaired, it will take its place among the greatest surviving wonders of the ancient world.

TEMPLE OF THE WARRIORS

The most imposing structure excavated by the staff of the Carnegie Institution at Chichen Itzá is the Temple of the Warriors, standing at the northwest corner of the Group of the Thousand Columns.

This truly magnificent building, the most elaborately decorated temple in the city—indeed, one may almost say in the entire Maya area—has been excavated and repaired by Earl H. Morris in a manner worthy of its original importance. It is no exaggeration to say that the rare combination of archeological knowledge and engineering ability demanded by this delicate work could hardly have been found in any other man.

The task was enormously complicated by the discovery that, buried within the pyramid supporting the Temple of the Warriors, was a still earlier temple. It had been partially demolished and then filled in to form a part of the pyramid supporting the later building.



BEARING HIS BURDEN THE WAY HIS FOREFATHERS DID

Material for repair work on the summit is going up on the top of an Indian's head just as in ancient times.

It became a problem of eating one's archeological cake and at the same time of preserving it. The buried temple had to be cleared of its rubble masonry fill and, at the same time, the northwest corner of the later temple above had to be suspended permanently over the excavated chambers below. Steel I-beams, Portland cement, and American ingenuity were the agencies which accomplished this apparent miracle (see page 126).

THE FEATHERED SERPENT WAS CHICHEN ITZÁ'S PATRON DEITY

The pyramid rises 37 feet in four receding terraces. The sides present three sculptured and painted friezes, extending



THE BOWL OF A TERRA-COTTA PIPE FOUND AT CHICHEN ITZÁ

Broken in four pieces, it was found buried beneath the floor of the Northwest Colonnade. It is 22 inches long and the widely flaring bowl is 3 inches in diameter. The head of a duck rests on the stem directly in front of the bowl, which is hollow and has a pellet of clay inside, so that the pipe rattles when it is moved.

around the pyramid except where interrupted by the stairway on the front, or west face.

The Temple of the Warriors stands on the broad summit. It is approximately 70 feet square and was originally 22 feet in height. A pair of great feathered serpent columns, 15 feet high, symmetrically placed, divides the entrance into three doorways (see pages 116, 118). The exterior walls are sculptured with alternating panels of grotesque human masks, the conventionalized representations of Kukulcan, the Feathered Serpent, patron deity of the city, and of the serpent-bird, a fearsome mythological conception, with the body, feet, and wings of a bird, the head of a serpent with forked tongue, and a human head issuing from its mouth (see, also, page 119).

The front chamber is a long colonnaded hall with 12 sculptured and painted columns arranged in two rows. Behind it is the sanctuary, with eight similarly carved and painted columns arranged in four rows.

Against the back wall of the sanctuary is an altar, removed from the buried temple below when the latter had been demolished. This is supported by 19 small statues of human figures, with their hands raised above their heads as if to sustain the floor slabs of the altar. The name Atlantean (after Atlas) has been applied to this class of small statues, which were very generally used at Chichen Itzá for supporting the larger altars (see page 123).

Masonry benches with sloping backs, apparently to facilitate reclining, are built against the back and side walls. Finally, all plain as well as sculptured surfaces, both inside and outside the temple, were brilliantly painted.

THE BURIED TEMPLE

In its heyday, with its broad summit thronged with priests gorgeously robed in jaguar skins, feather cloaks, and embroidered cotton stuffs, half seen in clouds of swirling incense, this building must have presented a picture of barbaric splendor well-nigh beyond conception.



NEW USE FOR OLD STONES

A bird bath in the author's garden at Chichen Itzá. The pedestal is an Atlantean figure, and the bath proper is an old *metate*, or corn grinder, deeply hollowed by the toil of long-forgotten generations of Maya women (see, also, text, opposite page).

The buried temple proved a treasure house in more ways than one. In the first place, in excavating the outer hall, sections of the pair of feathered-serpent columns which had originally guarded the doorway were brought to light. These were brilliantly painted in red and blue and, because they had been buried in ancient times, when their colors were still fresh, they were preserved in almost unbelievable brilliancy.

Lying on its back in a far corner of the outer hall, buried beneath the rubble fill, was the Chac Mool figure which had originally stood before the portals of this temple (see, also, text, page 120). Its carving is almost perfectly preserved, except for the nose and a part of the headdress, which would appear to have been battered off intentionally.

The carved and painted columns still preserve their colors in practically all their original brilliancy—red, blue, green, yellow, brown, black, and white; the walls are decorated with enormous plumed serpents, which weave around the sides of both chambers.

But the greatest discovery of all, the finest specimen ever recovered from the Maya area, the real treasure of the buried temple, was found by Morris under the floor of the sanctuary where the Atlantean altar had originally stood (see text, opposite page).

Morris had long suspected that if the buried cache, or ceremonial deposit, of this temple could be located, it would far surpass anything previously found in the city. On the morning of March 6, 1928, while excavating in the floor beneath where the Atlantean altar had formerly stood, his pick opened up a small hole. Quickly enlarging it, he uncovered a cylindrical limestone jar (see page 124) 14 inches high, 14 inches in diameter, and covered with a round limestone lid.

With all the staff gathered round, Morris examined the contents. As an electric torch was flashed into the dark interior a beautiful ball of jade reflected the light. This was carefully lifted out and proved to be an almost perfect sphere, two inches in diameter, highly polished. The Maya Indian laborers at once identified it as a



REMOVING TO HEADQUARTERS THE JAR CONTAINING A TURQUOISE PLAQUE
(SEE OPPOSITE PAGE)

This priceless repository was unearthed beneath the floor of the sanctuary of an early temple which was incorporated in the pyramidal substructure supporting the Temple of the Warriors, of a later date (see, also, text, page 123).

axtun, or conjuring stone, such as old Maya medicine men far back in the bush still use in their incantations and magic. A carved jade pendant, pierced for hanging on a cord, some jade and shell beads, and some bones of a very small bird, possibly a humming bird, successively came to light, but still the jar guarded its most precious secret.

THE TURQUOISE MOSAIC

Morris brushed away the accumulation of soft earth which had sifted in under the cover and gathered in the bottom of the jar, when suddenly there flashed forth the blue of turquoise, the first ever found in a Maya city. Breathlessly we watched as further brushing disclosed the scalloped edge of a turquoise mosaic, unfortunately in a perilously fragile condition.

Very slowly and with infinite pains the sifted earth was removed until there lay revealed on the bottom of the jar a mosaic plaque $8\frac{3}{4}$ inches in diameter. The wooden back to which the pieces of turquoise had been fastened had long since

crumbled to dust. Indeed, upon this dust rested the mosaic, so that any blow would have shattered the arrangement of the individual pieces.

No member of the Chichen Itzá staff had sufficient technical knowledge to remove the fragile treasure from its ancient container, much less to reset the mosaic on a new base. Outside assistance was imperative. Permission was received to summon the most skilled preparator of the American Museum of Natural History, S. Ichikawa, a Japanese, to undertake the repair of the priceless plaque.

It took him three weeks to reset the mosaic on a new base and another three weeks to make a water-color painting of it for the forthcoming publication on the Temple of the Warriors. In comparing the two, one wonders which is the more remarkable, the intricate delicacy with which the plaque has been repaired or the amazing accuracy of the painted reproduction.

The completed plaque was turned over to the Ministry of Public Education in

Mexico City and later was put on exhibition in the National Museum of Mexico.

MAYA SCIENTIFIC LIFE CENTERED IN THE OBSERVATORY

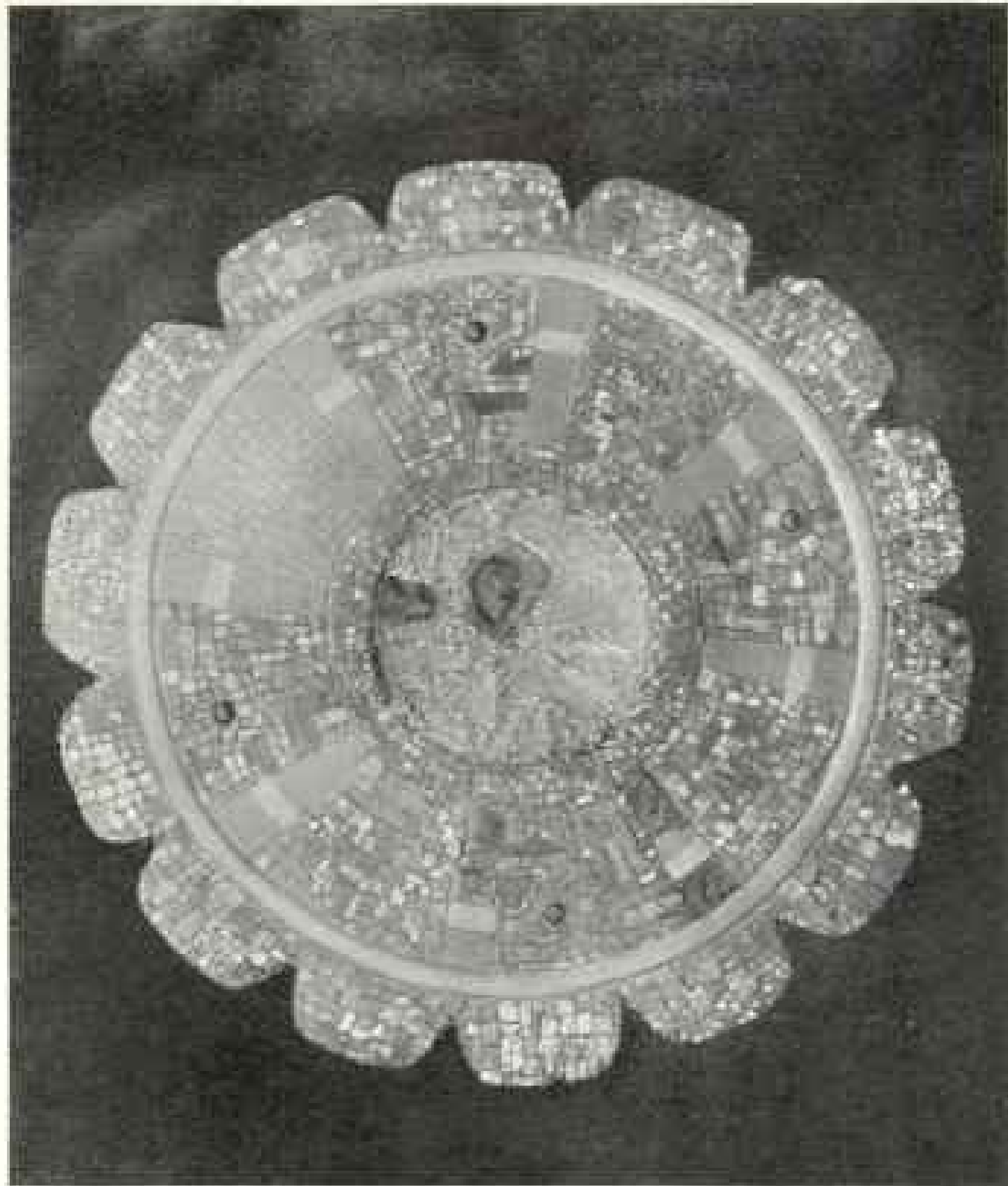
The Temple of the Warriors is not the only structure, however, where excavation and repair have been carried on at Chichen Itzá. The Caracol, or Astronomical Observatory, has been under study for several seasons. This round tower, 37 feet in diameter, is composed of two concentric circular passages which surround a solid core of masonry (see page 113). A spiral stairway ascends inside the latter, emerging in a small chamber near the top, from which observations of important astronomic phenomena were made through small tunnel-like passages.

This observatory was a building of primary importance. The scientific life of the community centered here, and it is thought by some to be the most beautiful structure in the city.

It is necessary to remember that the ancient Maya, or at least the priesthood, were astronomers and mathematicians of no mean ability. It is probable that every Maya city had some building which was used primarily for making astronomical observations (see, also, text, page 108).

Ten or 12 smaller temples in different parts of the city have been excavated and repaired, and many handsome sculptures, hieroglyphic inscriptions, and fine wall paintings have been brought to light.

Especially interesting are some of the



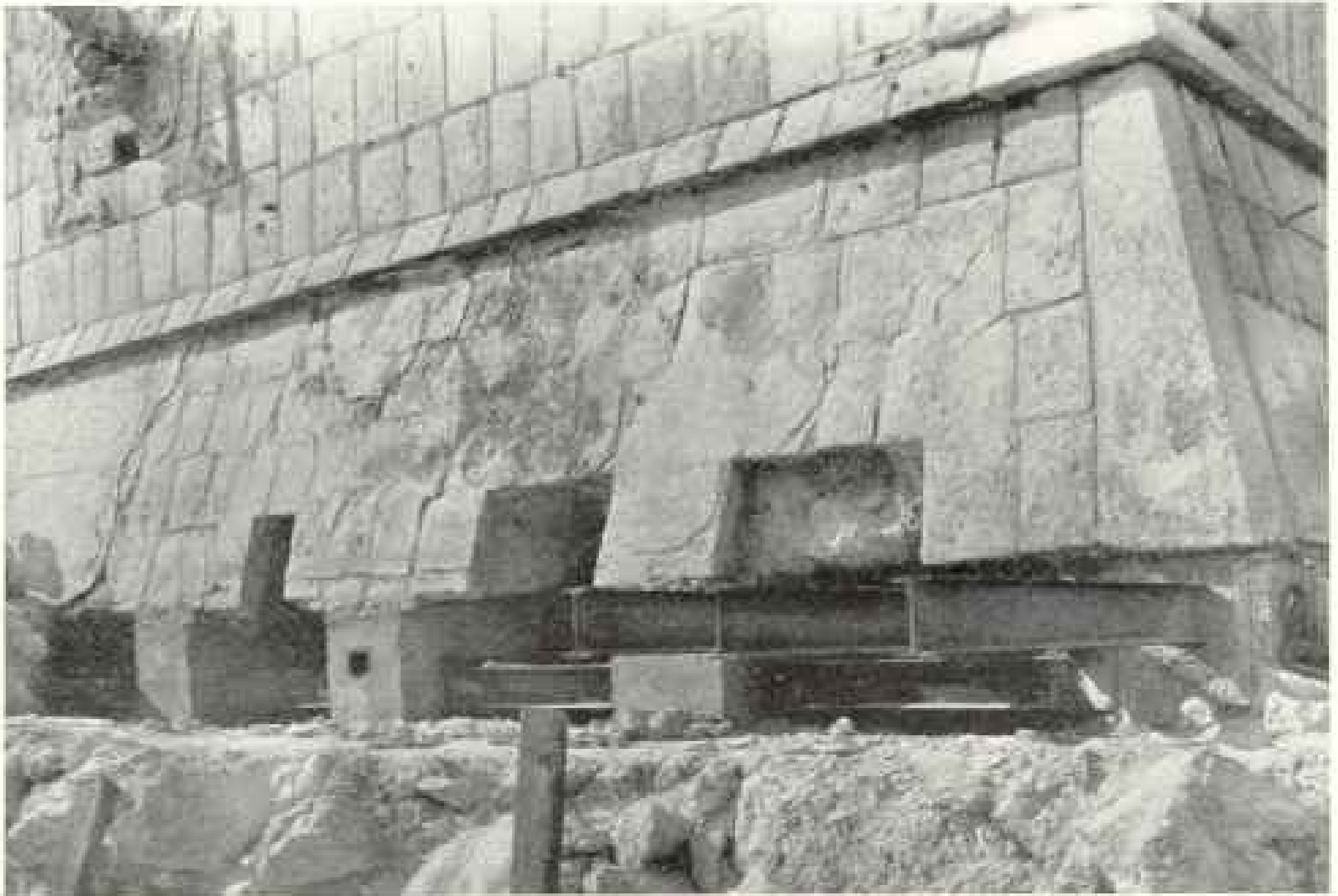
A TURQUOISE MOSAIC PLAQUE OF EXQUISITE
WORKMANSHIP

It was in such an extremely fragile condition when discovered that it was necessary to bring an expert, Mr. S. Ichikawa, from the United States to Yucatan to repair it (see text, page 124). It is eight and three-quarters inches in diameter and is composed of more than 3,000 pieces of cut and polished turquoise, with a sandstone disk center. The rim is scalloped and the edge has a lacquer of brilliant mandarin red. Four serpents' heads are represented in alternate sections of the mosaic, just inside the ring at the base of the scallops.

latter, which represent scenes of the daily life of the times. Women grinding corn and cooking over an open fire, men fishing and boating, warriors in the thick of battle, prisoners being led off to captivity, religious ceremonies and processions, even human sacrifice, are portrayed with a sureness of brush, strength of delineation, and elimination of the unessential which strongly recall the virility of the best modern art.

FIFTEEN CENTURIES OF ANCIENT AMERICAN HISTORY

Uaxactun, judged by the dates actually recorded upon its monuments, is the old-



PITTSBURGH STEEL TO THE AID OF FALLING MAYA TEMPLES

An overhanging corner of the Temple of the Warriors was supported by a series of intermeshing steel I-beams, which later were supported from below by reinforced concrete columns (see, also, text, page 121).

est Maya city; Chichen Itzá, according to the late Maya chronicles, the so-called Books of Chilán Balam, which give synopses of the history of Yucatan, is the oldest city of the New Empire. Therefore, with excavations going on at these two sites, the Carnegie Institution has 15 centuries of ancient Maya history under study and investigation.

It is far too early to write the final history of this period. Indeed, we are only beginning to grasp its major outlines, its grand divisions. Many years of dig-

ging; of weary search through insect-ridden, fever-infested, all-but-impenetrable forest, for new cities and additional hieroglyphic inscriptions; of laborious researches of specialists in different fields of learning; of coöperative investigations of numerous scientific institutions—all lie between the present and the writing of the final chapters of Maya history. But a beginning has been made, and it is not too much to claim that the introduction to the story of our most brilliant aboriginal civilization is now "ready for the press."

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TO carry out the purposes for which it was founded forty-three years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

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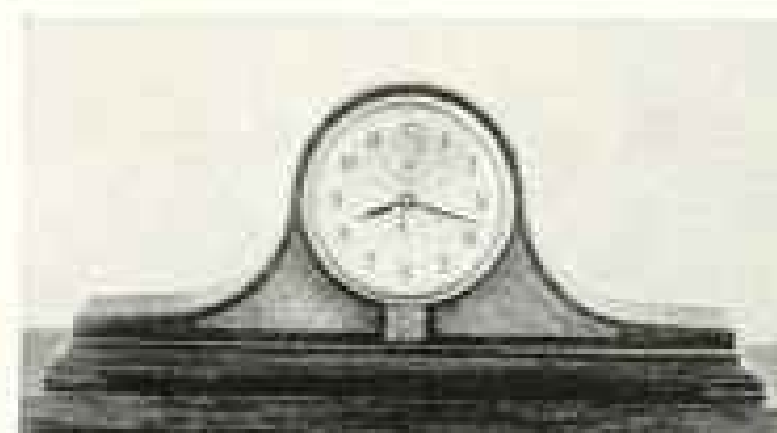
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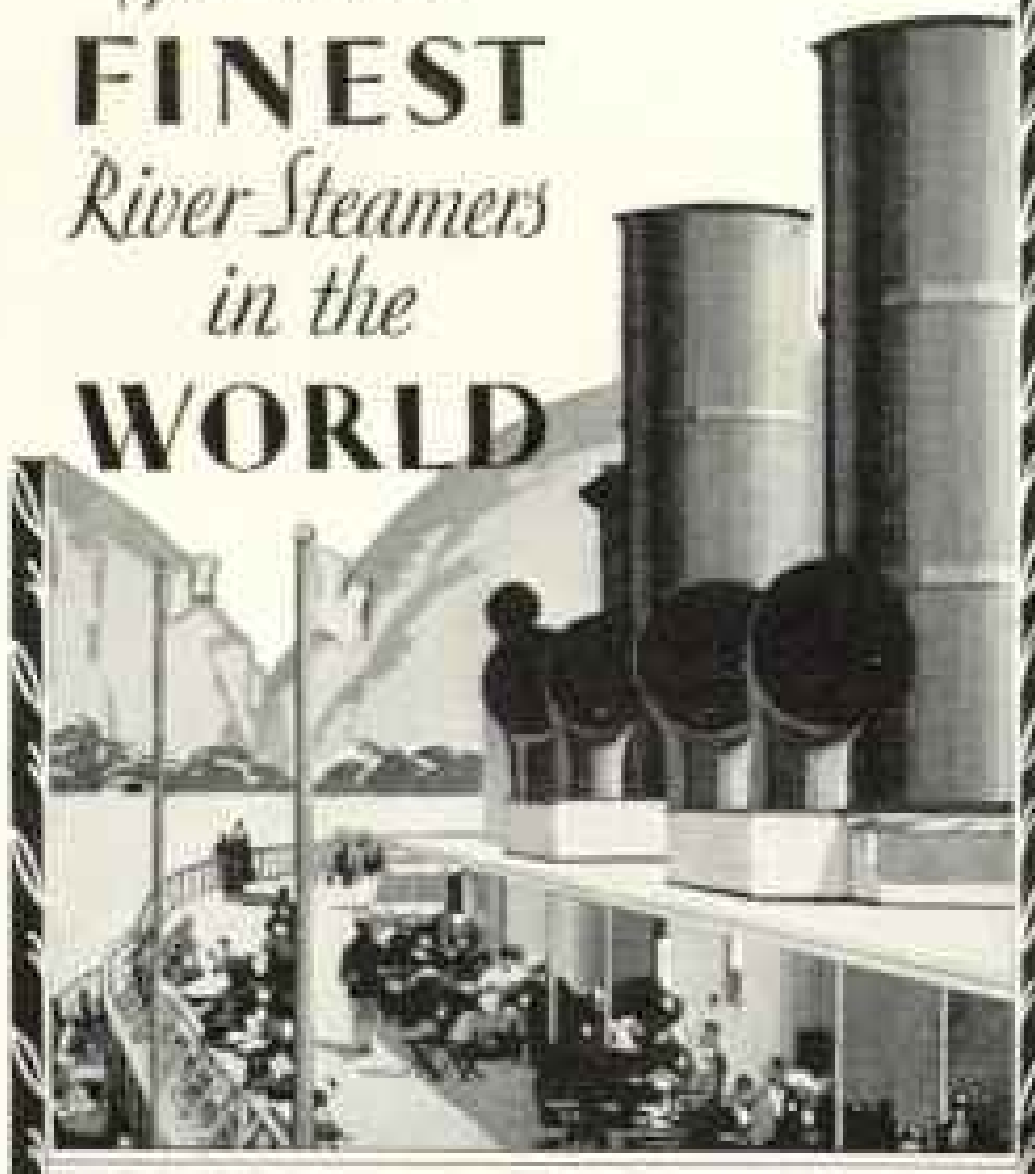
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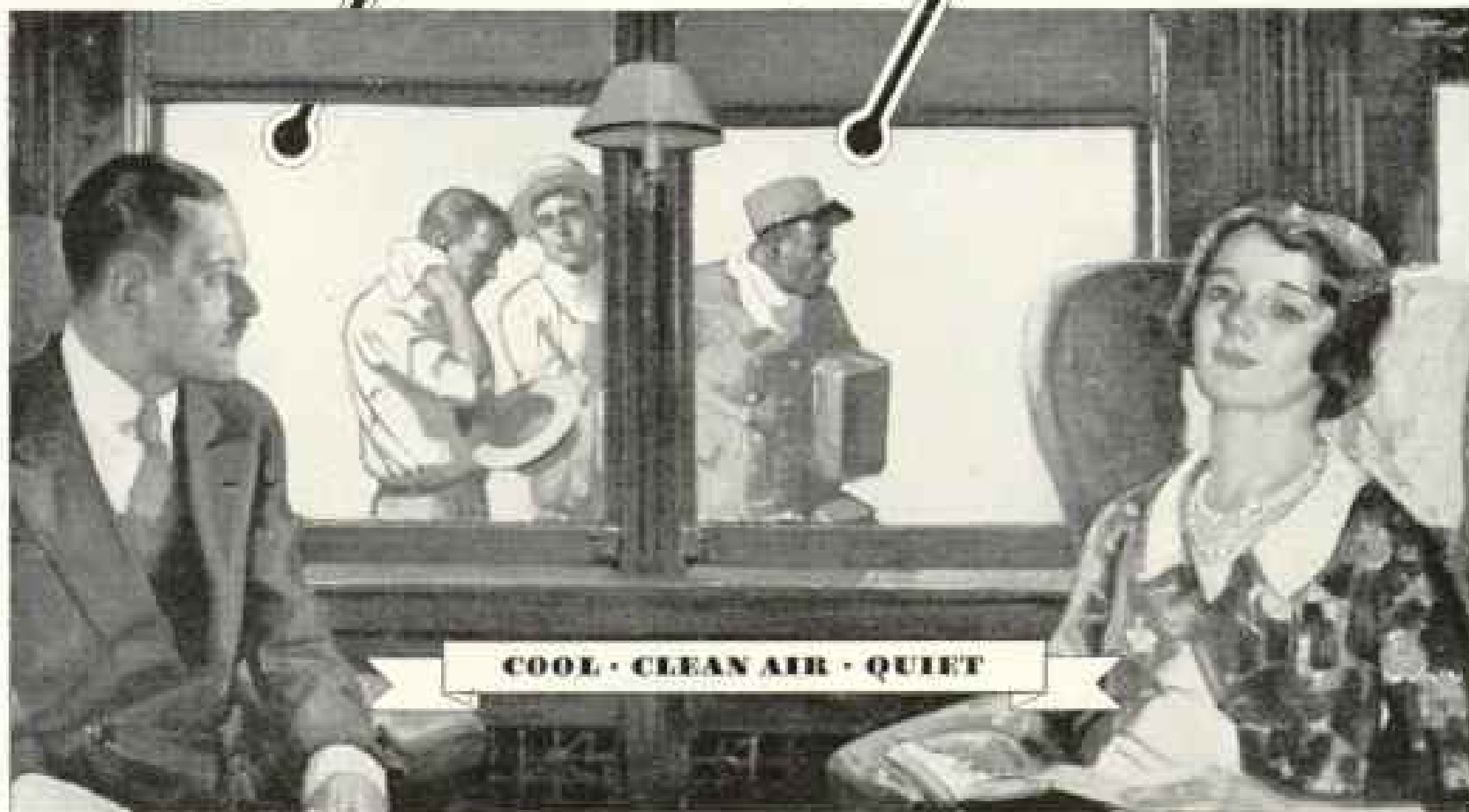
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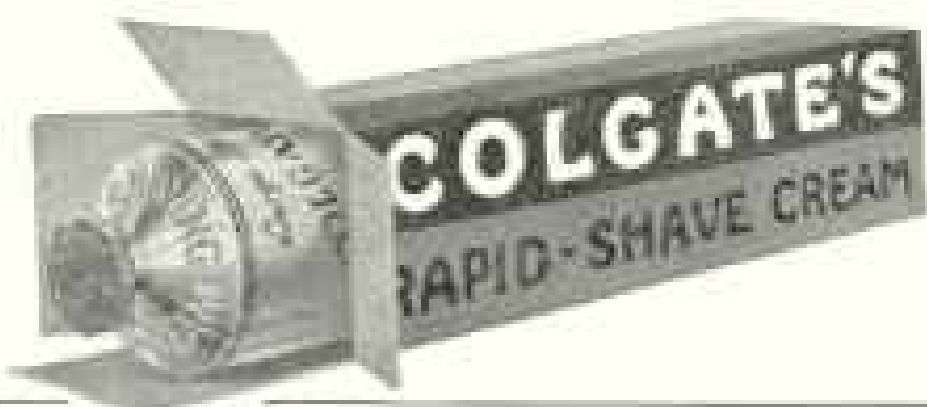
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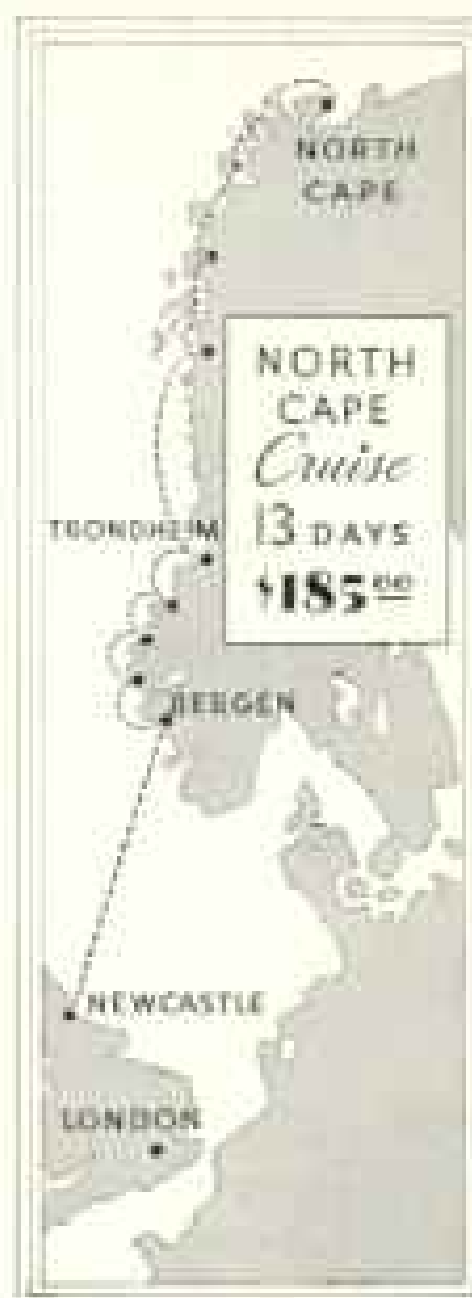
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The grim warning "Drive Slowly, Death is so Permanent!" has been heeded by thousands of drivers over dangerous roads.

Here are listed the twelve most frequent means of accidental injuries in the order of their fatality:

- | | |
|--------------------|-----------------------|
| 1. Automobiles | 7. Firearms |
| 2. Falls | 8. Machines |
| 3. Drownings | 9. Mines and Quarries |
| 4. Burns | 10. Fires |
| 5. Railroads | 11. Poisons |
| 6. Poisonous Gases | 12. Suffocations |

In this country accidents are now the largest single cause of the Crippling, Dependency and Destitution which call for relief.

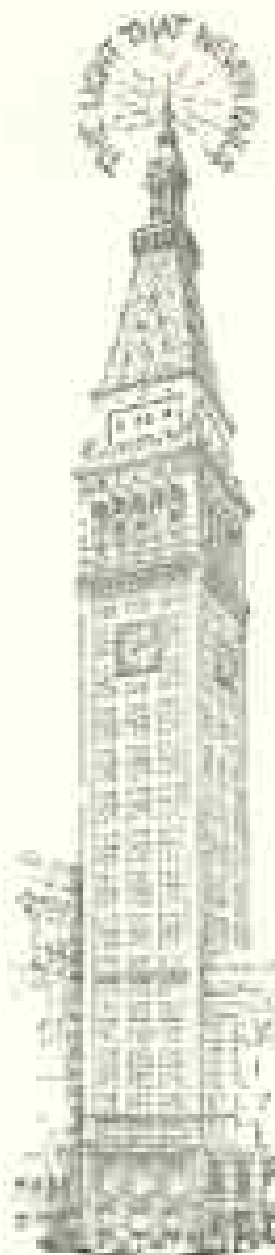
ACCIDENTS took 100,000 lives; caused approximately 10,000,000 more or less serious injuries and cost more than \$1,000,000,000 last year in the United States.

Among those killed by accident were 18,000 children under fifteen years of age.

No one knows how many accidental injuries and deaths are due to uncontrollable circumstances. Nevertheless, how many of the accidents which happened to members of your family or your friends—accidents which you know all about—could have been avoided?

Last year there were about 46,000 fatal accidents in homes and in industry. Elsewhere there were about 54,000 accidental deaths. Among the latter group 32,500—motorists and pedestrians—were killed by automobiles.

But while the tide of accidents is



steadily rising, there are some bright spots in the dark record.

Better traffic regulations in a large number of cities are reducing the percentage of street accidents and the toll of killed and maimed children.

Police officers and school teachers are training children to be careful.

Safety appliances and methods installed by the foremost industries are saving many lives.

But systematic accident prevention in homes has hardly begun.

Falls in homes caused 8,000 deaths last year; burns, scalds and explosions 5,400; asphyxiations 3,600; and fatal poisonings 2,000. Much remains to be done to check home accidents caused by recklessness and thoughtlessness.

The Metropolitan Life Insurance Company urges you to send for its free booklets on accident prevention. Ask for Booklets 731-N.

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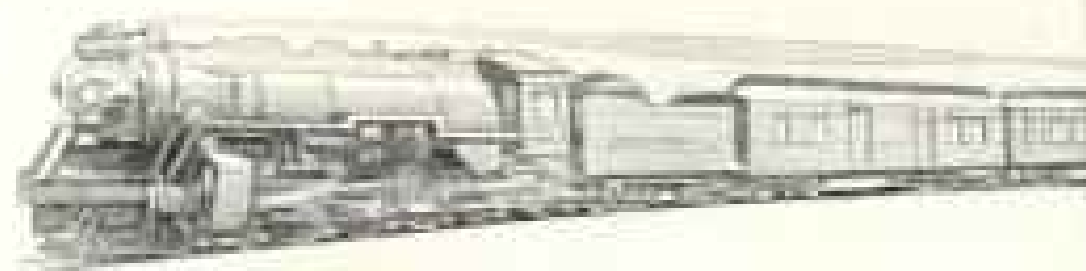
You simply add an equal quantity of cold water, bring to a boil, simmer a few minutes and serve. So easy and convenient.



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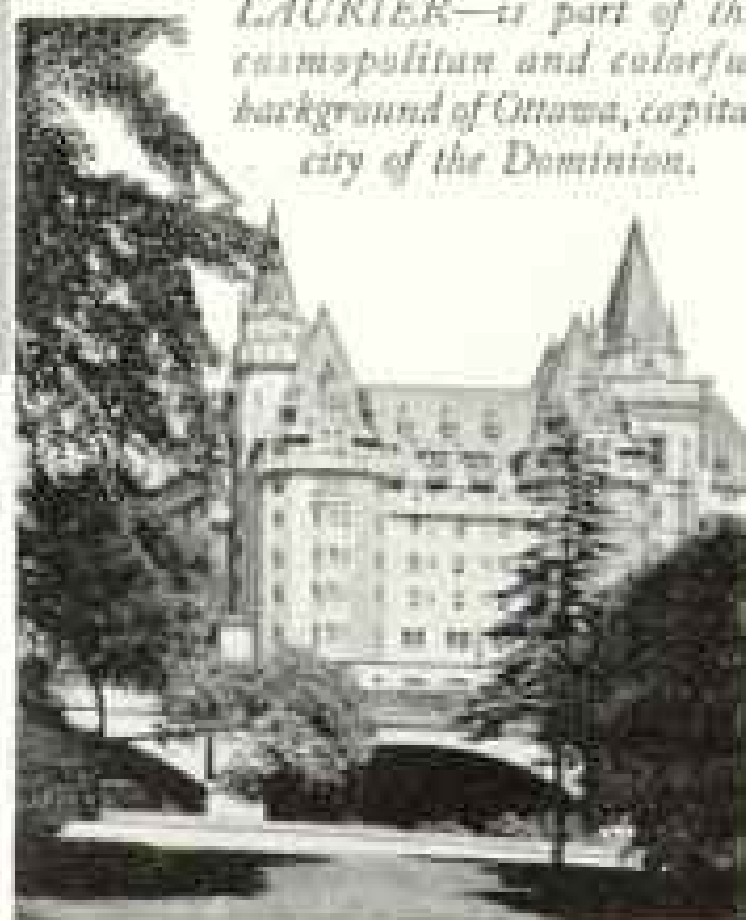


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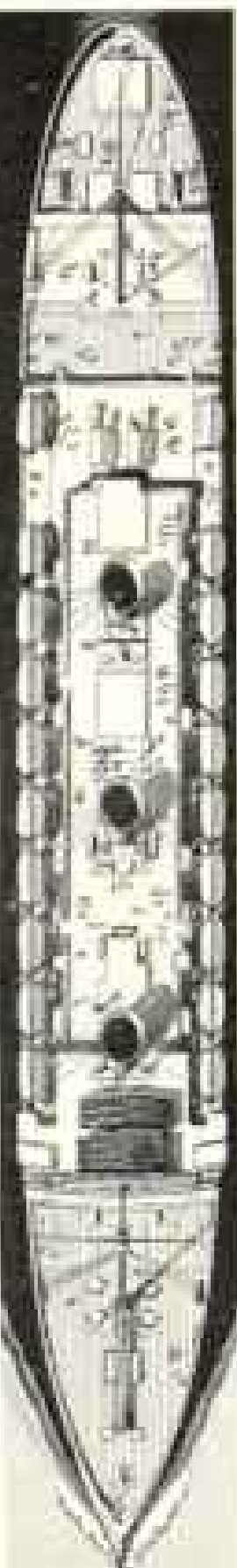
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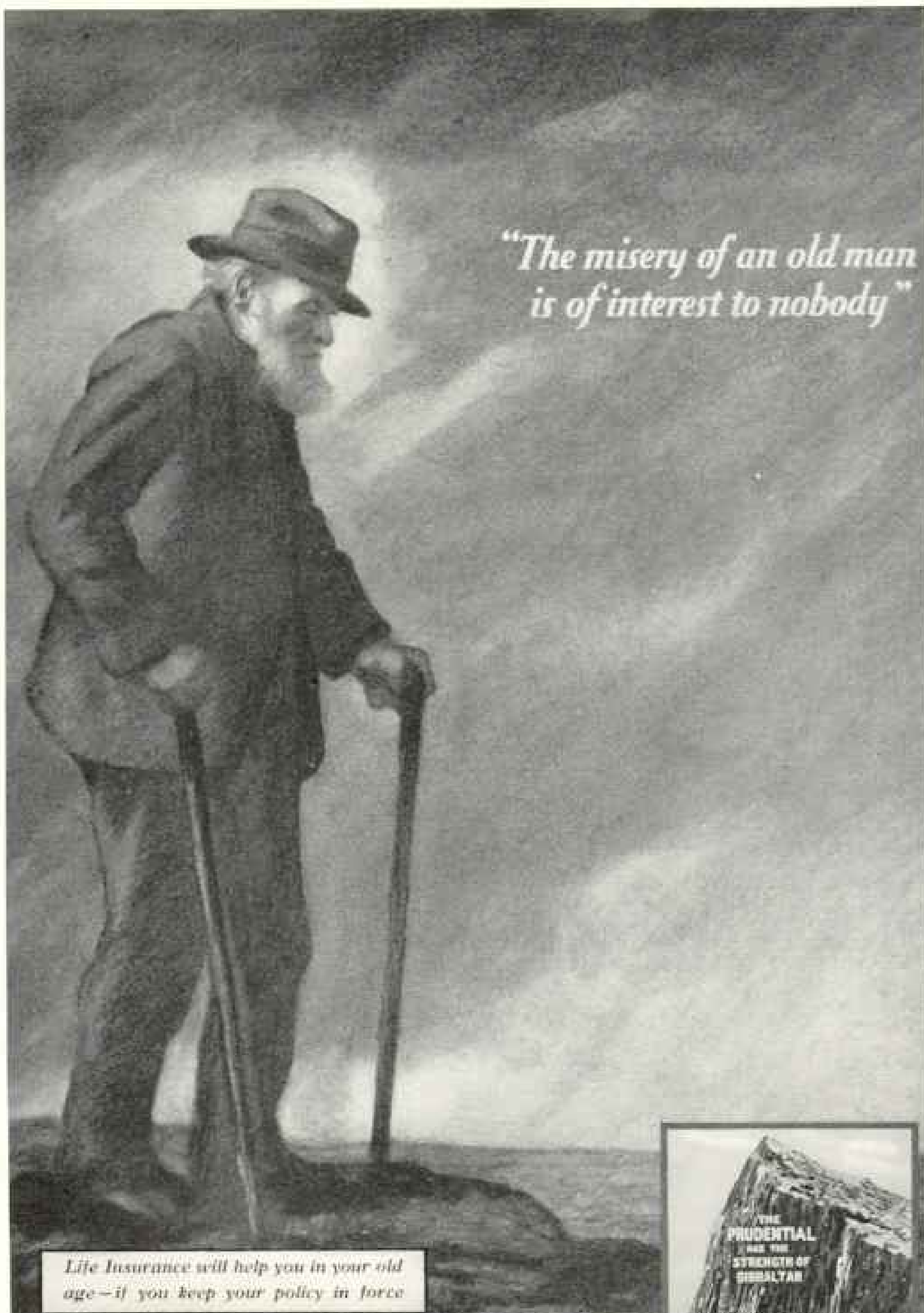
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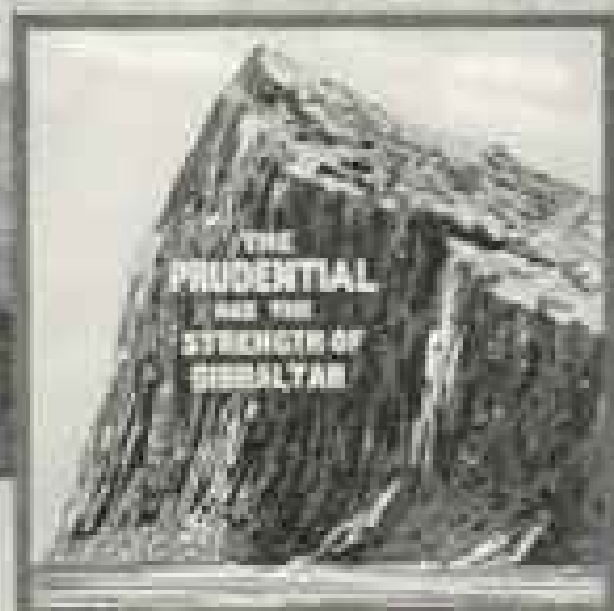
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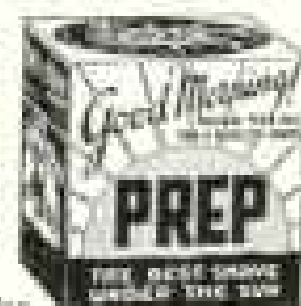
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- you want the cleaner that protects the health of your loved ones and you by removing deeply-embedded, germ-laden film
- you want the cleaner that brings back the fresh, new coloring of your rugs
- you want the cleaner that reflects your own good judgment in its purchase, just as your other possessions do—the cleaner everyone has a good word for
- you want the cleaner that has always been first in efficiency and which today is three times as efficient as it was five years ago
- you want the only cleaner that employs the exclusive patented principle of Positive Agitation—the only cleaner that *beats* as it sweeps as it cleans
- you want the cleaner that gets Mote Dirt Per Minute
- you want The HOOVER!
- for The Hoover and The Hoover alone can answer, not one but every one of the above challenges and requirements—for it is the modern electric cleaner.

Let the Hoover Representative show you *with* The Hoover that what we've said *about* The Hoover is true in every way.

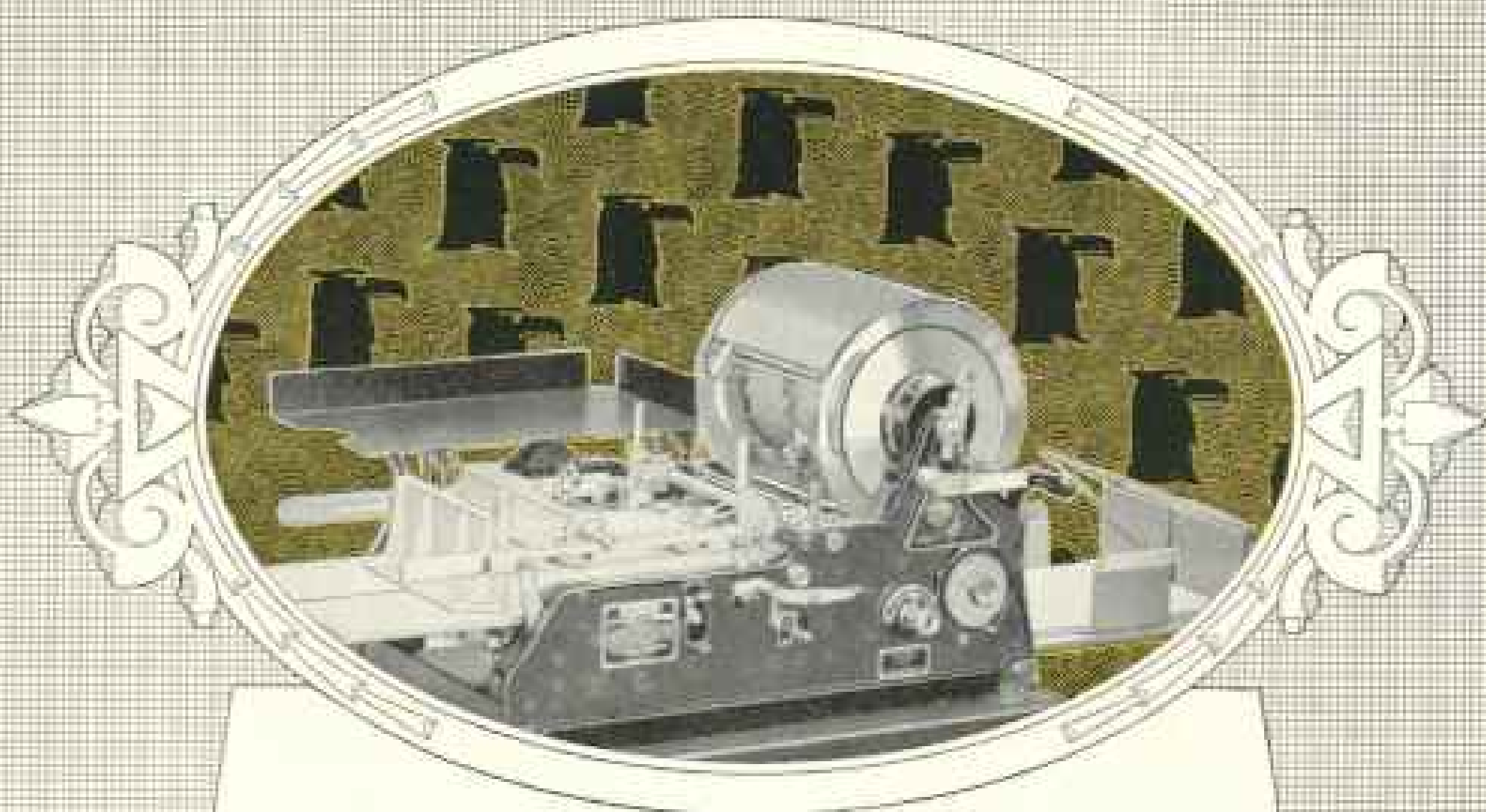
The New HOOVER

IT BEATS . . . AS IT SWEEPS . . . AS IT CLEANS . . . ON A CUSHION OF AIR



NOTE: Hoover has always been first in cleaning efficiency. Five years ago it was far ahead of any other cleaner offered at that time. Today The New Hoover is by scientific home-cleaning tests three times as efficient as the Hoover of 1926.





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