

WALTER HELLMICH

**RESEARCH SCHEME NEPAL  
HIMALAYA  
NEPAL RESEARCH CENTER:**

**REPORT 1971**

*G. B. Kalikote*

**Gesamtleitung des Forschungsunternehmens Nepal Himalaya,  
des Nepal Research Centers und Herausgeber von KHUMBU HIMAL:  
Prof. Dr. WALTER HELLMICH, München**

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## REPORT 1971

by

WALTER HELLMICH

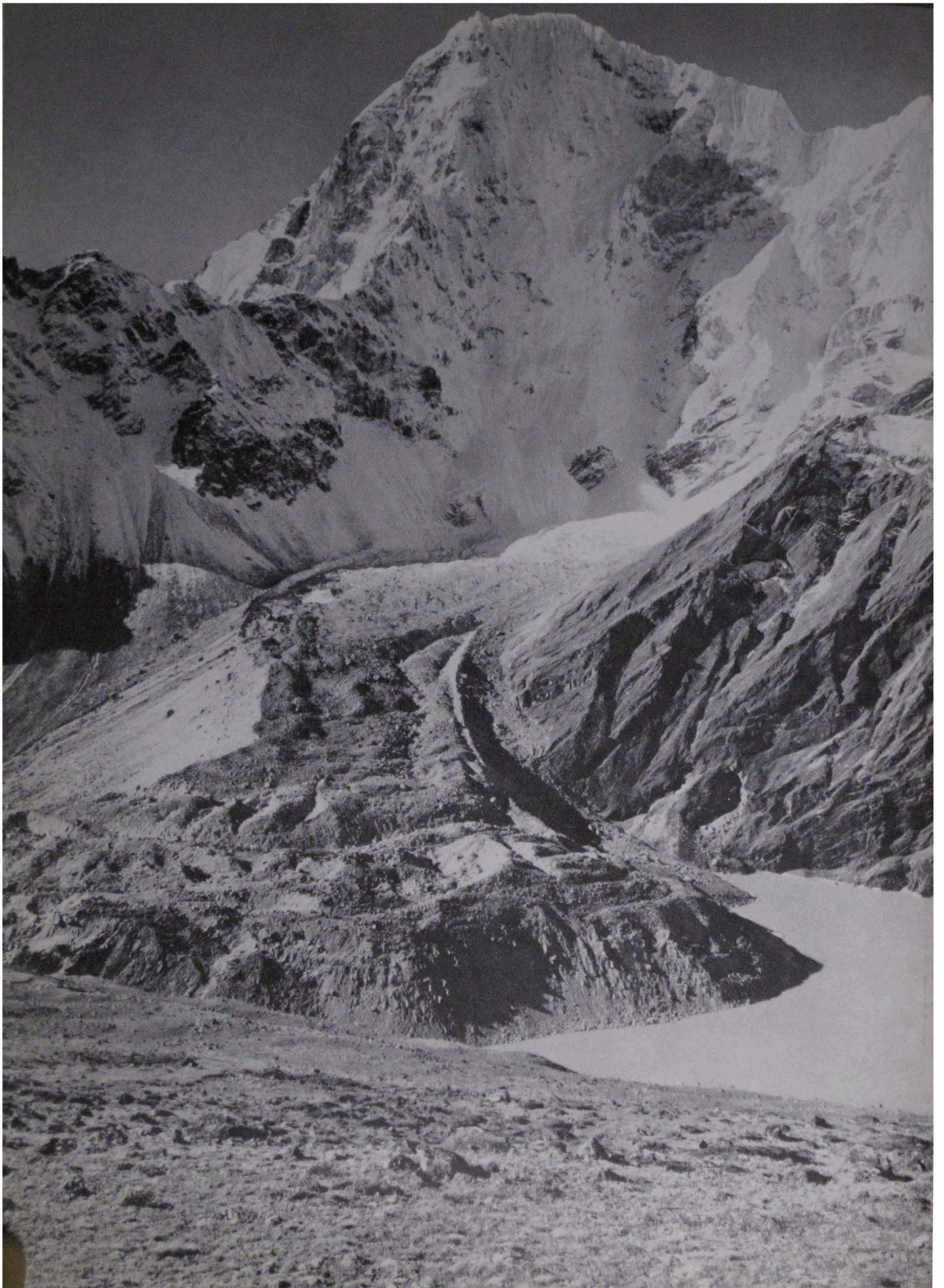
The map "Chomolongma-Mount Everest" 1:25.000 which was published in the yearbooks of both the German and the Austrian Alpine Clubs in 1957, in the "Zeitschrift für Vermessungswesen" in 1958, in the Mount Everest Book of HAGEN, DYRENFURTH, VON FÜRER-HAIMENDORF and SCHNEIDER in 1959, and as a supplement to "Erdkunde" in 1965, gave rise to plan a new expedition.

The idea of this map originated from the climbing expedition of NORMAN G. DYRENFURTH which tried in 1955 to reach the summit of Lhotse, 8500 m, situated in the south of Mount Everest. This expedition was joined by ERWIN SCHNEIDER, the cartographer of the Austrian Alpine Club which latter sponsored his participation. He succeeded in making a stereophotogrammetric survey not only of both the region to the south and west of Mount Everest, but also of the adjoining region of the Ngojumba glacier as far as the Cho Oyu with a height of 8153 m, which region was not covered by the map 1:25.000. ERWIN SCHNEIDER and also the gentlemen of the scientific committees of both the clubs, who took care of the field of cartography, were not contented with filling out little gaps on the Everest map, but set their heart on the plan, as originally intended by SCHNEIDER, to map the entire Everest group from Cho Oyu, respectively the pass Nangpa La in the northwest, to the Makalu in the east. The idea of ERWIN SCHNEIDER was enthusiastically adopted by the late Prof. Dr. R. FINSTERWALDER and propagated in the Scientific Committee of the German Alpine Club. Among the members of the committees of both the clubs arose the desire to map not only this area, but to unite the already existent map and the maps to be created in future with a thorough universal research on geographic, glaciological, and biological problems of this unique section of the highest mountains of the earth.

This research was intended to continue on the one hand the work of the NOTGEMEINSCHAFT DER DEUTSCHEN WISSENSCHAFT (EMERGENCY SOCIETY OF GERMAN SCIENCES) which already had enabled the Alai Pamir Expedition of 1928 and the Nanga Parbat Expeditions of 1934 and 1937, as well as the DEUTSCHE FORSCHUNGSGEMEINSCHAFT (GERMAN SOCIETY FOR THE ENCOURAGEMENT OF SCIENTIFIC RESEARCH) with the expeditions to the Karakorum in 1954 and 1959, on the other hand they should extend the studies on vegetation by Prof. Dr. C. TROLL, The investigations had also the purpose to complete the zoological collections from Pamir, the Hindu-Kush, the Karakorum, and other areas of the Asiatic high mountains which, for the most part, are housed in the ZOOLOGISCHE STAATSSAMMLUNG (STATE ZOOLOGICAL COLLECTION), MUNICH, and to evaluate them for the solution of general problems of high mountain ecology.

This idea of a universal study of the vertical zonation of high mountains, ranging from the tropical plains of the Nepalese Terai up to the foot of the highest peaks of the earth, was born in the centenary of the death of ALEXANDER VON HUMBOLDT in whose spirit the expedition should be carried out and to whose memory it should be dedicated.

The author of the present report, who had taken over the whole organization of this research project, felt from the very beginning that such investigations could not be carried out within the framework of a short-termed large expedition, but only by a body of scientists coming to a large



extent from all branches of natural sciences, and who were to be sent out in successive teams and who should work according to a planned programme over a longer period of time in the research area. In this way besides the universality also the continuity of the investigations could be aspired. Thus the enterprise differs fundamentally from previous and only short-termed expeditions of a mixed mountaineering and scientific character. Also the plan, cherished since a long time by Prof. Dr. C. TROLL and the author to study the fundamental problems of "Comparative Ecology of High Mountains", should be carried out as well -- an enterprise which in respect to the actual level of science can never be undertaken by a single person but only by teams.

At the suggestion of the DEUTSCHE FORSCHUNGSGEMEINSCHAFT an EXPEDITION COMMITTEE was formed. Its members were German and Austrian experts on Alpine Research which met for the first time in Munich on 31 March 1960, its task was to propose qualified scientists for participation in partial expeditions, to coordinate the scientific plans, to examine the future papers, and to recommend them for publication. With unanimous resolution of the members Prof. Dr. H. KINZL, Innsbruck, overtook the presidium on occasion of the foundation session. Later, Dr. TONI HAGEN, an enthusiastic promoter of our ideas succeeded in interesting the ROYAL NEPALESE GOVERNMENT for our plans. He obtained an invitation which enabled us to carry out an enterprise, originally planned for 2-3 years. Herein it was stated that the Nepalese Government expected valuable informations from the planned "RESEARCH SCHEME NEPAL HIMALAYA" and would moreover have the possibility to provide a practical training to qualified persons from Nepal.

Thanks to an initial provision of funds by the Federal Chancellory as well as the Federal Ministry of Internal Affairs the research work could start. In the year 1960 Dipl.-Ing. ERWIN SCHNEIDER and cand. rer. nat. U. GRUBER were delegated to fly to Nepal as an advance party. Private donations and later on the generous total financement by the FRITZ THYSSEN STIFTUNG (FRITZ THYSSEN FOUNDATION) permitted, however, not only to carry out all plans, but to grant as well the extension of the enterprise to ethnological research.

*The map* always forms the basis of all scientific work, whether this be of a biological, ethnographical or medico-anthropological nature. It was a matter of course, therefore, that the cartographic surveys should be carried out first. The bases for the large-scale map-work planned were laid in three winter expeditions (1960/61, 1961/62, 1962/63) by Dipl.-Ing. ERWIN SCHNEIDER, S. AEBERLI, F. BITTERLE, P. BREUER, U. GRUBER, G. KERNER, H. SCHRIEBL as assistant geodesist, F. ELMIGER of Switzerland as our guest, and KUNO RAINER and ERNST SENN, as experienced climbers to help in solving particularly hard alpine problems, all took part in the expeditions of SCHNEIDER, of course distributed over the various teams. GUZZI LANTSCHNER accompanied one of the teams as photographer.

At the beginning, a total of some 2.000 mi<sup>2</sup> could be surveyed and measured. The foundations for the planned map-work were laid in the approximately 500 photographic plates (13/18) which were obtained. The extreme cold and storms presented particular difficulties and considerably hindered the work on the ridges and summits. At times the tents collapsed under the pressure of the wind or the weight of the snow. The highest altitude at which fieldwork was carried out (roughly 22.000 ft) was reached by the AEBERLI-SCHRIEBL team.

The entire work was at first undertaken utilizing terrestrial photogrammetry, since the great absolute distances above sea-level of the survey object, in part including summits exceeding

26.000 ft, and the appreciable differences in altitude, which in the region to be mapped can amount within a very small area to over 16.000 ft would have made vertical photos from the air extremely difficult. Finally, the extraordinary steepness of the vertical rise of the terrain and the close proximity of the Tibetan frontier (China) also tipped the balance in favour of the adoption of terrestrial methods. Thanks to the cooperation of the Nepalese government, ERWIN SCHNEIDER, FRITZ EBSTER, who arrived in Kathmandu from Innsbruck in January 1962, HUBERT SCHRIEBL, FRANZ ELMIGER and PETER AUFSCHNAITER were able to fly over the entire area surveyed in a Pilatus Porter. Finally, in December 1964 and in the same month of 1965, ERWIN SCHNEIDER was able to take aerial photographs of the Outer Himalaya region which complement the earlier terrestrial pictures and were intended to facilitate the evaluation and the thoroughness of the ethnographic work.

Very soon the biological work could also be begun. U. GRUBER, who had helped E. SCHNEIDER during the first cartographic survey as assistant geodesist, was able to remain in Nepal after SCHNEIDER'S departure on 15 March 1961. He first continued his studies in the Karnali Region on behalf of the Nepalese Government, during which he was also able to make observations for comparison with his impressions in East Nepal. During the summer of 1961, Dipl.-Ing. MAX WUPPERMANN made known his lively interest in our plans. His donation and a further financial contribution made by his father made it possible for us to send a second team out to Nepal. It was composed of Prof. Dr. H. JANETSCHKE of Innsbruck as leader, Dipl.-Geol. Dr. F. LIST of Munich as geologist, and Dipl.-Ing. M. WUPPERMANN as technical adviser. This group was joined by U. GRUBER, who was able during the succeeding period to add to his collection of Nepalese small mammals. Unfortunately, LIST and WUPPERMANN soon fell ill. But Prof. JANETSCHKE succeeded, among other things, in measuring a lateral profile from Taboche at a height of 17.040 ft across the Dudh Kosi Valley (12.800 ft) to the west-facing slopes of the Amai Dablang up to a height of some 20.000 ft. At numerous places within this profile, examinations of the soil, of the vegetation, and of the animal communities were also made. When JANETSCHKE left Kathmandu with LIST on 28 June 1961, he was able to take back with him a collection of some 10,000 specimens of small animals, a herbarium, and a collection of amphibia and reptilia.

A second biological team was able to start its work in Nepal during the spring and summer of 1962. Members of the team were Dr. G. DIESELHORST as ornithologist and J. POPP as taxidermist, both of the ZOOLOG. STAATSSAMMLUNG MUNICH, and G. EBERT and H. FALKNER as entomologists, who likewise took part in the fieldwork on behalf of the same STATE ZOOLOGICAL COLLECTION, and Dr. BERND ALTMAYER of Mittenwald/Garmisch-Partenkirchen, as physician. Both the ornithologists and the entomologists worked at first in the hot region of the Terai, and then in the border region between the Siwaliks and the Mahabharat Chain, gradually climbing to high-lying areas of some 19.500 ft above sea-level. In spite of the very great handicap to the work caused by the monsoon, and in spite of cold, humidity, dirt and vermin, fine collections of specimens and extensive observations could be made. As last member of this team, Dr. J. POELT of the BOTANISCHE STAATSSAMMLUNG (STATE BOTANICAL COLLECTION) MUNICH, left for Nepal on 15 August 1962 in order to pursue lichenological studies in addition to those of a general botanical nature.

A mixed team of meteorologists and biologists set out for Nepal in February 1963. Dr. H. KRAUS and K. HACKL, both of the UNIVERSITY INSTITUTE OF METEOROLOGY MUNICH, had been preparing instruments over a period of several months with the help of which they succeeded in making measurements of the energy balance on the earth's surface in high-lying regions of Khumbu Himalaya. In addition, two weather stations could be set up in central Nepal at a

height of 6.000 and 10.000 ft respectively. Dr. HAFNER brought back from his excursion, which took him on several occasions from the Terai to the highest altitudes in the Everest region, well over 10.000 tracheophyte specimens and soil samples gathered from 30 profiles taken at varying heights. Priv.-Doz. Dr. F. ZIMMER accompanied this group as physician.

After an interval of some four months, the research work was taken up again in March 1964. Once again two entomologists flew — as always with KLM — out to Nepal: Dr. W. DIERL of the ZOOLOGISCHE STAATSSAMMLUNG MUNICH, and Dr. R. REMANE of the ZOOLOGICAL INSTITUTE OF THE UNIVERSITY OF MARBURG. These studied groups into which no intensive research had so far been made, as for example the microlepidoptera. In contrast to the first team of entomologists, they collected in the reverse direction, which means they began at the high altitude levels, descending then by stages.

Priv.-Doz. Dr. H. LÖFFLER of Vienna joined this seventh team in the summer of 1964. In Nepal his task was to study the various categories of running and stagnant waters. Along the approximately 60 lakes shown on the Everest map already published by SCHNEIDER, and thus situated within the immediate research area, include the greatest variety of lake types. LÖFFLER was able to pursue his researches on 26 of these lakes. Among them were the largest lake of the area, the Tshola Tsho, with a difference of some 65 ft between its highest level during the summer monsoon and its lowest in autumn, and a cirque situated at a height of some 18.200 ft between the Nuptse glacier and the tongue of the Khumbu glacier. LÖFFLER's research work will permit interesting comparisons to be made with the findings of the limnological work he had previously carried out on lakes in Chile, in Peru, and on Mt Kenya.

The zoological collections made, which in the entomological and ornithological fields for example embrace some 100.000 insects and some 2.000 bird skins, have been consigned to the ZOOLOGISCHE STAATSSAMMLUNG MUNICH, for treatment and evaluation. This STATE ZOOLOGICAL COLLECTION can, therefore, be regarded as the Central Institute for the zoological study of Nepal.

We were fortunate in that the FRITZ THYSSEN STIFTUNG lent its support to the plan to extend the Research Scheme by including investigations of an ethnological nature. A team of ethnographers and medical experts set out for Nepal in early 1965 under the leadership of Prof. Dr. F. W. FUNKE, Cologne. Members of the team were the two physicians, Priv.-Doz. Dr. S. HEINRICH and Dr. G. GRÖSCHEL, W. LIMBERG, M. OPPITZ, and G. C. TESCHKE, and Miss M. SCHMIDT-THOMÉ. The doctors, to complement the ethnographical investigations into the distribution of the Sherpa, carried out research into blood groups, which were intended to show especially how far the blood groups among the Sherpa differ from those of other Nepalese tribes and of their Tibetan neighbours. In addition, the team strove to obtain an overall view of the state of health obtaining among them. To this end, examinations especially of stools and urine were made and investigations into metabolic, helminthic and venereal diseases, and the frequency of goitre. Like all their colleagues who had taken part in the work of the Research Scheme, the doctors of this team, too, gave outpatient treatment to sick members of the indigenous population.

Within the framework of the ethnographical investigations, Prof. Dr. F. W. FUNKE, Cologne, took personal charge of the study of the spiritual and intellectual life of the Sherpa. Documents which promised to throw light on the descent of the various Sherpa clans were discovered in a large number of Sherpa villages. It was possible to acquire a great number of manuscript copies of until now unknown religious texts; their evaluation promises to be of extraordinary significance for the knowledge of the religious life of the Sherpa. Extensive investigations were conducted into the total distribution of the Sherpa, the division according to sex and age in the

villages, the extent of the land under cultivation, the distribution of land ownership, and the summer and winter migrations. After advancing as far as the Khumbu glacier and as far as Beding, the highest-lying Sherpa village, all members of the team set out on the march back to Kathmandu. In addition to her studies of the material culture of the Sherpa, Miss SCHMIDT-THOMÉ was able, after her return to Kathmandu, to institute comparative studies in Sherpa ornamentation.

It was possible to make a beginning with the publication of the first results of our research, while the fieldwork was still in progress. To our great pleasure and gratitude, the FRITZ THYSSEN STIFTUNG also agreed to meet the regular printing costs and to finance the preparation and printing of the maps planned. In order to avoid scattering the various articles containing the results of our research throughout a number of specialized periodicals, often difficult of access, the suggestion won approval that all the results of the "Research Scheme Nepal Himalaya" should be published in a single series, which was to bear the general title "KHUMBU HIMAL". This title was chosen because the field work took place for the most part in the region which bears that name and which presents a fairly self-contained area within the Nepalese Himalayas. We began especially with the publication of the systematic studies in order to guarantee priority to the task of fixing nomenclature for the large number of new species and subspecies of plants and animals. The first publication contained an introduction to the work of the Research Scheme. In the three following of the works are to be found studies of a zoological, botanical, meteorological and medical nature. The fifth publication of volume 1 consisted of the first map, KHUMBU HIMAL, which covers the region from Nangpa La and from Cho Oyu to Makalu and from the Nepalese Tibetan frontier as far roughly as south of the Amai Dablang, includes four 26.000 footers, and covers some 965 mi<sup>2</sup> to a scale of 1:50.000. Thanks to the support of the German and Austrian Alpine Clubs, their cartographers, Dipl.-Ing. FRITZ EBSTER and ERWIN SCHNEIDER, were able to prepare the map in Innsbruck. FREYTAG-BERNDT & ARTARIA, Vienna, took over the printing. The map is of inestimable value to mountaineers and all branches of alpine research. Many of those who study it will be surprised by the number of new names which appear. PETER AUFSCHNAITER gave considerable help in ensuring their local accuracy. Three further maps are in preparation and should appear shortly.

The Research Scheme is happy to be able to put on record that all participants gave of their best to attain the goals that had been set them and that all members were spared from accidents or serious illnesses. Thanks are also due to countless porters and above all to the Sherpa, without whose help and spirit of sacrifice many a task could not have been completed. Special mention should be made of Sirdar URKIEN, who was in our service right from the beginning. Most sincere thanks are also due to our Swiss colleagues who most willingly placed at our disposal the various installations of the SWISS RELIEF WORK for Nepal in the Ekanta Kuna, Kathmandu, in Jiri and in many field posts, and made possible many flights into the region covered by the expedition. We may be forgiven for not mentioning all the persons concerned by name. Our deepest debt of gratitude is to NEPAL itself, especially the many representatives of the government in Singha Durbar, who gave us permission to enter East Nepal and to carry out our research, and who saw that everything ran smoothly for us.

We are grateful to the first Ambassador of the German Federal Republic to Nepal Dr. LÖER who stimulated us with his suggestion not to let the Research Scheme simply peter out after we had completed the work we had originally set ourselves, but to seek for an opportunity of continuing our research in another form. This led us to think of erecting a permanent seat for the Research Scheme in Kathmandu. During an audience granted the author of this report by H. M. the King of Nepal at the end of February 1965, he had the opportunity to suggest the foundation



of a "NEPAL RESEARCH CENTER". Our plans met with the ready approval of his Majesty the King and the governmental departments concerned. We found a recently-built house, very suitable for our purpose, in Chauni, in the west of the city, and very close to the Museum. It has guest and social rooms, and offers ample opportunity for installing a library and laboratories; we shall also be able to take advantage of the large garden. We are again indebted to the FRITZ THYSSEN STIFTUNG for financing this institute, which as "NEPAL FORSCHUNGSINSTITUT" at the same time has its seat in the ZOOLOGISCHE STAATSSAMMLUNG MUNICH. The official opening took place in Kathmandu on 17 November 1965. H. R. H. the Crown Prince of Nepal, members of the ministries and of the German Embassy graciously took part in the ceremony (Fig. 2).



*Fig. 2:* Nepal Research Center, Kathmandu ("Thyssen House").

Fot.: E. SCHNEIDER

After the official closing of the RESEARCH SCHEME NEPAL HIMALAYA in the year 1965 further groups of scientists could be sent to Nepal within the framework of the scheme. Dipl.-Ing. ERWIN SCHNEIDER carried out three further winter expeditions in order to continue the terrestrial and aerophotogrammetric survey and to extend the mapping. Mr. and Mrs. LIMBERG travelled through the mapped region of Tamba Kosi - Likhu Khola and registered by tape recorders the names of all settlements. P. AUFSCHNAITER helped to translate these names into Nepali language. Thus the second map contains about 700 names of places which are localized and nominated here for the first time. Dr. W. DIERL, Dr. W. FORSTER, and H. SCHACHT, Munich, collected further entomological specimens and made observations and experiments on

Nepalese insects and their biology. Mrs. Dr. HICKEL devoted her time to limnological studies in the Valley of Kathmandu and in the basin of Pokhara. Dr. W. HAFFNER, Aachen, undertook further excursions to complete his geographical and botanical studies.

In the framework of the NEPAL RESEARCH CENTER, Dr. BÜTTIKER, Basel, stayed in Kathmandu, in order to make studies on eye-visiting insects in the Valley and in the Terai. Prof. Dr. FRANZ, Vienna, twice a guest in the Research Center, made entomological collections and studied the fauna of the soil, the second time accompanied by his daughter Miss Dr. FRANZ, Bonn. Dr. J. MARTENS, Mainz, made expeditions in the Khumbu Himal and in the region of the Annapurna and the Daulaghiri, collecting spiders, insects, birds, and small mammals, and investigating their biology and distribution. Dr. LEFEBRE, Lyon, worked in the medical sector. Dr. CAPLAN, New York, was occupied with ethnographical problems. Dr. A. HÖFER, Heidelberg, visited the Research Center several times and initiated the study on a Thamang village. A working-team, under the leadership of Dr. HÖRBURGER and TONI GRAD, Regensburg and Munich, came twice to the Thyssen House to make a musicological documentation (they brought back about 36 km recording tapes of profane and religious music). Dr. W. HEUBERGER, Innsbruck, made glaciological and geographical studies on settlements in the Khumbu region. Mr. and Mrs. W. THIEDE, Tokyo, studies the breeding biology of starlings. H. KLEINERT, Aachen, examined different types of houses in rural districts of nearly the whole of Nepal. Mr. FRANK, Cologne, stood several times in the Thyssen House and Central Nepal, to undertake demographic investigations in Thamang villages. Mr. LUDWAR studied family life and problems in Tibetan villages.

An agreement between the Royal Government and the Federal Republic of Germany of 16. 10. 1967 authorizes us to investigate the entire Nepal in the fields of topography, geography, biology, medicine, and ethnology. It grants us great facilities for the importation of the necessary materials for laboratories and expeditions as well as books for the installment of a library. This agreement sanctioned also the equipment and the functioning of the NEPAL RESEARCH CENTER. The former Expedition Council was transformed on 11 October 1965 in presence of Prof. Dr. JULIUS SPEER, President of the DEUTSCHE FORSCHUNGSGEMEINSCHAFT and Dr. ERNST COENEN, representative of the FRITZ THYSSEN STIFTUNG, into an ARBEITSGEMEINSCHAFT FÜR VERGLEICHENDE HOCHGEBIRGSFORSCHUNG (ASSOCIATION FOR COMPARATIVE ALPINE RESEARCH) as supporting body responsible for the NEPAL RESEARCH CENTER with its seat in Munich. A second agreement between the same partners could be concluded on 16. 1. 1970. It permits the arrangement of a MANUSCRIPT PRESERVING PROGRAMME. Since 1970 a body of German scientists is staying in Kathmandu in order to register by means of two xerox apparatuses the extremely voluminous literature which is stored in archives, and monasteries or to be found in private hands. This material will be examined scientifically, a task which probably takes five years of intensified studies.

A further programme (TEMPLE RESTORATION PROGRAMME) under the curation of Prof. Dr. H. RAU, Heidelberg and Bombay, could begin with the restoration of a priest's house in Bhadgaon. This programme comprises at the same time a documentation of all works of art in Nepal (the Number of temples and shrines in the Valley of Kathmandu is estimated at 2.000) and will as well take several years.

Besides further students working different scientific projects the Thyssen House sojourned a number of important persons from science and culture for shorter or longer periods of time. We only cite the professors BERNHARD, Hamburg, BIEBL, Vienna, DERBOLAFF, Bonn, DOLFUSS, Paris, FUNKE, Cologne, GROPP, Cologne, JAAHKS, Mainz, JANERT, Cologne, KOLMAC, Prague, LADSTETTER, Bonn, UHLIG, Giessen. In March 1967 the Federal President HEINRICH LÜBKE

and his consort payed a visit to the THYSSEN HOUSE. In spring 1971 the RESEARCH CENTER received for several days the President of the DEUTSCHE FORSCHUNGSGEMEINSCHAFT Prof. Dr. JULIUS SPEER as a guest.

Thanks to the generous sponsorship of the FRITZ THYSSEN STIFTUNG we have the possibility to continue the publication of further volumes of the series KHUMBU HIMAL after the completion of volume one with five numbers. Until 1. 12. 1971 already two large maps in the scale 1:50.000 have been finished. The map "KHUMBU HIMAL" has already been cited. In the year 1969 the second map entitled "TAMBA KOSI - LIKHU KHOLA (NEPAL)" could appear. The entire map covers a region of 2.096 km<sup>2</sup>. ERWIN SCHNEIDER wrote "some notes" which appeared in the first number of volume 7 of KHUMBU HIMAL. The same number contains a paper of W. LIMBERG on the localities and their names printed on this map. They are summed up in an alphabetical index with numbers referring to the position in each grid square of the map. Thus the finding of localities is essentially facilitated. The map is not only of high value to scientific work in the presented area, but also of practical advantage for the administration of that region by the Royal Nepalese Government.

Besides these maps, the so-called "Forest-Map" and the unicoloured map "SOLU KHUMBU" were published. The forest map, scale 1:50.000, covering a part of Khimti Khola, the middle Likhlu Khola and the upper Solu Khola, in all an area of 945 km<sup>2</sup>, served the team of Prof. Dr. W. F. FUNKE (ethnology) in the start of fieldwork. Later on it was used as an appendix to Dr. G. DIESSELHORST'S paper on the birds of Central and East Nepal. The map SOLU KHUMBU, scale 1:100.000, covers an area of about 3.000 km<sup>2</sup>. It is used as topographical basis for work in different fields. Then, with coloured signatures, it accompanied the paper of M. OPPITZ (KHUMBU HIMAL, volume 8). Besides this, it is provided for a paper of W. LIMBERG on "Cultivation of Land and Social Structure in SOLU KHUMBU" (under work), together with a one coloured map of Bhandar (1:10.000), 20 km<sup>2</sup> finished in 1965.

Sheets with contour lines for three further maps (Gauri-Shankar east, Gauri-Shankar west, Dudh Kosi) have already been terminated. The west-sheet of Gauri-Shankar was extended to the west up to the region of Barabise. Thus the entire trail from Barabise, the last village to be reached by cars on a well practicable road, up to Mount Everest is mapped. Presumably the maps of Gauri Shankar may be published in the year 1972.

The first volume of KHUMBU HIMAL contains — as already mentioned — papers of different fields: botany, zoology, geography, medicine, and cartography. Volumes 3, 4, and 5 are reserved for zoological publications, volume 6 for botanical, and 7 for geographic meteorological ones. The results of ethnological research appear within KHUMBU HIMAL under the subtitle: F. W. FUNKE, "Contributions to Sherpa Investigations Part I—V" as volumes 8 to 12 inclusively. A further volume with ethnological documents will probably follow as a supplement. Thus from the sequence of smaller and more voluminous papers and treatises, a complete picture of the KHUMBU HIMAL region will be given. A final volume in English language will comprise the total results of the research scheme, a translation into Nepali and a print in Nepalese letters are provided for.

In the course of studies on the huge collections of zoological specimens (about 250.000 insects, 2.500 bird skins, 500 amphibians and reptiles, 300 mammals) stored in the ZOOLOGISCHE SAMMLUNG DES BAYERISCHEN STAATES MÜNCHEN (ZOOLOGICAL STATE COLLECTION OF BAVARIA, MUNICH), it soon turned out that the taxonomy of different animal groups has reached very different levels. Whereas among the collected birds no new species or subspecies could be discovered, there were few among the mammals. The botanical specimens on the other hand yielded 3 new genera, 30 new species and 22 new subspecies, and the entomological collections 10 new

genera, more than 200 new species and 20 new subspecies. Until now the collections are only partly worked out. for a number of animal and plant groups specialists have not yet been found.

A detailed treatise on the birds of the survey area was given by Dr. G. DIESELHORST. In his "Contributions to the Ecology of the Birds of Central- and East Nepal" (KHUMBU HIMAL, volume 3). DIESELHORST writes on the problems of vertical distribution, population number and development, breeding seasons, moult, and migration of 366 bird species. Following U. SCHWEINFURTH (1957), the author divides the entire region from the Terai up to the foot of the highest mountains in the following vertical zones:

0	0— 3.300 ft	Tropical deciduous forest (wet sal forest)
I	3.300— 8.000 ft	Tropical evergreen lower montane forest
II	8.000—12.000 ft	Tropical evergreen upper montane forest
		a) evergreen broadleaved forest
		b) Rhododendron-Coniferous forest
III	12.000—14.000 ft	Sub-alpine forest
IV	14.000—18.000 ft	Alpine

The bird-fauna of Nepal can be divided into forest-birds, nonforest-birds, and alpine birds. 90% of the species-assemblage forming the Nepalese forest fauna are ultimately of oriental provenance. This statement conceals the fact of the influx of a predominant oriental, typical montane faunal element from the eastern section. This montane element, called "Himalayan", is especially represented by the passerines of zones II (upper montane) and III (alpine). Palaearctic elements enter the sub-alpine zone (III) only, and also mainly in the passerines. The Himalayan range thus constitutes a narrow zone of intergradation between the oriental and palaearctic faunas respectively.

The complex of non-forest birds is made up by two different components, the autochthonous, mainly palaearctic alpine fauna and the oriental lowland and hill fauna which, for the most part, immigrated into the cleared country from the Indian lowlands. With increase of altitude, the mainly oriental non-forest fauna is more sparsely represented, whereas it is dominant in the lowlands. The degree of differentiation in the vegetation zones I—III is less than in the respective forest fauna.

About 95% of the alpine species are exclusively or mainly of palaearctic origin, most of them are primarily alpine or montane. A few elements only of the alpine assemblage are not primarily alpine but occupy a large altitudinal range. Nearly two thirds of the mainly palaearctic species are of a roughly Central Asian distribution. Many of them occur over much of the large mountain systems from China and Indochina to Turkestan and the Soviet mountains.

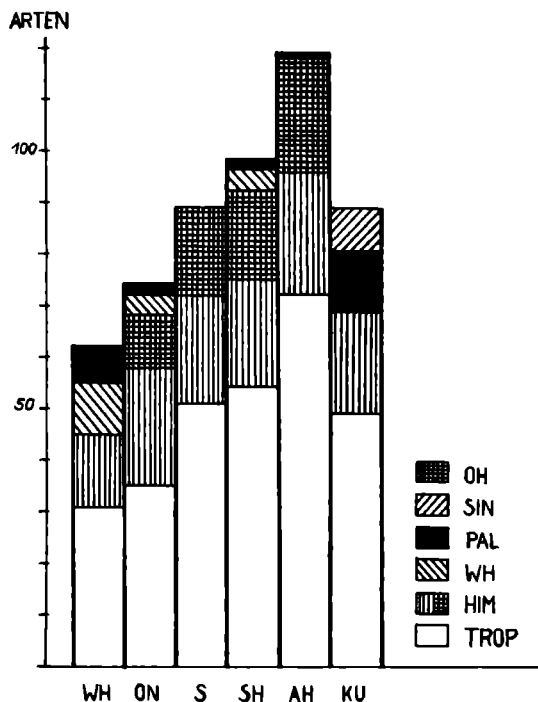
The forest ornithology of Nepal has probably evolved without severe interruption through the Pleistocene until recent times to form the autochthonous fauna of the country. Within historical times extensive cutting of the forest and cultivation has severely restricted the range of forest birds. The consequence has been an archipelago-like splitting with many isolated patches and relatively few larger continuous areas of forest. The map accompanying the paper of DIESELHORST shows, on the example of the section Khimti Khola, Likhu Khola, Shorong Drangpa, the reduction of forest and its splitting into separated forest-islands.

In contrary to the forest fauna, just the opposite trends have effected the non-forest fauna in recent times. There has undoubtedly been a shift of populations of non-forest birds into the cleared country with a consequent increase in the number of individuals. Nearly all of the present non-forest fauna in Nepal is evidently of very recent origin. This does not apply to the ancient alpine fauna which has not suffered severe structural changes comparable to the forest fauna.

In his paper on the zoogeography, ecology, and bionomy of small mammals in East Nepal, U. GRUBER (Volume 3) comes to the conclusion that *Rattus cha*, *Pitymys sikimensis*, *Sorex cylindricauda*, and the species of *Soriculus* have their nearest relatives in the region of West Szechwan, Northwest Yunnan, and North Burma. According to GRUBER's opinion these localities represent the territories of origin of those species that are characteristic for the typical "Himalayan Fauna Group" of small mammals. This Himalayan group is located in the transition area between the palaeartic and the oriental faunas.

W. DIERL divides in his paper on "Principles of ecological Zoogeography in Sphingid Moths of East Nepal" (Volume 3) those butterflies, the best known lepidoptera of the region, into tropists (species of Indomalayan, Indoaustralian, Indian, and palaeotropic distribution), Himalayan species with a main distribution in the wet subtropical, hardleaved summer-monsoon forests, into western Himalayan, Palaearctic and Chinese species. The distribution of these various faunal elements in the West Himalayas, in East Nepal, Sikkim, in the Sikkim Himalayas as a whole, in the Assam Himalayas, and in Kuangtung are shown in a diagram (Figure 3) which demonstrates that the tropists form the highest percentage, the palaeartics, however, the smallest one. The distribution of all sphingid moths confirms that the designation of an East Himalayan sub-region is correct. The center of this sub-region are the Assam Himalayas. The faunistic areas of the Himalayas are corresponding to the floristic and climatic areas as represented by TROLL (volume 1) in his paper on "The Climatic and Phytogeographical Structure of the Himalayan System". East Nepal is a part of the Sikkim Himalayas, West Nepal a part of the Garhwal Himalayas, Nepal forming a transition between the wet East Himalayas and the dry West Himalayas.

Fig. 3: Distribution of the Faunal Elements in W-Himalaya (WH), E-Nepal (ON), in Sikkim (S), in Sikkim-Himalaya altogether (SH), in Assam-Himalaya (AH) and in Kuangtung (KU). The Easthimalayan Elements (OH) are separately designated as a subgroup of the Himalayan Elements (HIM). (After DIERL, 1970: 347, Fig. 14).



Elsewhere W. HELLMICH pointed out that according to our actual knowledge Nepal cannot be regarded -- at least not categorically and only for some selected groups -- as a center of development in the sense of DE LATTIN, and that the boundaries between eastern and western Nepalese species are not presented by a profile drawn from the Mount Everest to the south, but is situated further in the west, in the region of Mustang. According to accounts of H. HEUBERGER the glaciers of the ice-age did not reach as far and as far down to the south, that they

could have formed a faunal barrier. It is assumed that the southward extension of the Tibetan dry zone in the region of Mustang should have a greater effect on the distribution of western faunal elements to the east and of eastern ones to the west. For a final solution of the problem much further collecting in the area cited will be necessary.

The cited paper of TROLL (TROLL divides the whole Himalayan system into the sections Assam-, Sikkim-, West Nepal-, Garhwal-, Punjab-, and Indus-Himalayas and points to the asymmetry of the entire mountain range) and the paper of HAFNER "East Nepal: Principle Features of the Vertical Terrain Formation" (both published in Volume 1) give an excellent introduction into the ecological situation of the principal research area of the scheme. Authors who did not travel themselves in this region will find there an excellent help for orientation. The same holds for the description of "The climate in Nepal" by KRAUS (Volume 1). In order to describe that climate, attainments firstly on the general circulation of the atmosphere above India and Nepal and secondly the relatively small number of all accessible meteorological observations from the country are taken into consideration. The last ones which are of great value for the description of the climate, are explained by means of numerous tables.

In a detailed paper KRAUS gives an account on the results of his investigations on free and covered ablation in the Everest region (Volume 1). He proves that the amount of ablation can be calculated but that it depends on so many parameters that it is not possible to show all connections of the ablation processes in one single diagram. Therefore, many diagrams are shown that represent the dependence of the ablation on the different meteorological factors and — in case of covered ablation — on the heat transmission coefficient of the covering material. A third chapter of this paper shows many illustrations about the glaciers and the small glacier forms of the ablation in the environs of the Mount Everest.

In a later paper (Volume 7) KRAUS together with his collaborators HÄCKEL and HÄCKL reports on the diurnal variation of the energy balance of the earth's surface at the alp Chukhung in the Everest region. The set-up of an energy balance station in the Inja Khola valley at 15,600 ft and the performance and evaluation of the measurements are described. For 11 selected days in April 1963 the diurnal variation of the radiation and heat budget over bare soil is represented in the form of tables and diagrams and discussed in detail.

In the same volume of KHUMBU HIMAL. DITTMANN presents "Statistical Investigations on the Structure of Precipitations in Nepal". A coloured picture, of the northern Kali Gandaki Valley shown here in figure 4 illustrates some characteristics it has in common with other Himalayan river beds: an arid zone in the middle of the valley contrasts to relatively wet slopes. This phenomenon can be judged from the vegetation belts in the horizontal profile of the valley. Typical are the overhanging clouds accumulating during daytime. A strong and steady wind is blowing upwards from the valley during daytime, but in the night no reversed phenomenon can be observed, the breeze will merely "fall asleep". In his "Contributions to the Meteorology of the Himalayas" published in the same Volume (7). FLOHN discusses the special atmospheric conditions in the Himalayas. They can only be understood, if the local climatic conditions, originating from thermal circulation on different scale, are correlated with the regional thermal circulation between the Tibetan highlands and the hot tropical lowlands of the Indo-Pakistanian plains, and also with the large-scale synoptic processes of planetary circulation. From added satellite pictures, taken in summer, the disruption of the Himalayan ridge into single structured blocks elucidates much clearer than on maps of any scale. Those blocks are separated by high up, relatively wide, valleys, narrowing only in their middle parts into nearly unaccessible ravines.

In an until now unique paper concerning medical problems, ZIMMER (Volume 1) discusses the Tibetan medical practice — also known as lamaistic medicine — a science which has today not



*Fig. 4:* The northern Kali Gandaki Valley, 2. 9. 67, 12.00 h local time, looking at north, location above Kagbeni, ca. 3100 m. (After DITTMANN, 1970: 56, Fig. 10).

only a high reputation in the eyes of the Tibetan people, but also among millions of human beings in central Asia. ZIMMER tries to show a way of understanding lamaistic medicine to the abstractly thinking westerners.

Some more extensive publications are dedicated to the research in Nepal of the ethnological team under the leadership of Prof. Dr. W. F. FUNKE. The results will be published -- as already mentioned -- under the subtitle of the KHUMBU HIMAL series "Contributions to Sherpa research" Part I--V.

Of these contributions both the detailed treatises of OPPITZ (Part I, KHUMBU HIMAL, volume 8) and of FUNKE (Part II, Volume 9) are issued until now. OPPITZ deals with the history and social order of the Sherpa. In the course of his research project devoted to the anthropological study of the Sherpa, the famous Himalayan population of Eastern Nepal, several members of the team and the author discovered significant documents, they found them in private houses, in temples, and in Buddhist monasteries of the Nyingmapa sect. This discovery rendered it possible for the first time to formulate a number of historic hypotheses concerning the original homeland of the Sherpa people, their migrations and the final settlement in Solu-Khumbu and the expansion of their clans. These hypotheses are also supported by oral traditions of the Sherpa and by the application of statistical data, collected during the expedition. The more or less conjectural history of the Sherpa may be summarized as follows:

The Sherpa, now forming a distinct ethnic group among the hilltribes of the Himalayas with a population of more than 13.000 individuals in their main dwelling area of Solu-Khumbu, were not always inhabitants of Eastern Nepal. Their ancestors came to their present home in the

region of Mount Everest from a district called Salmo Gang in the eastern Tibetan province of Kham. This migration of more than 1,250 miles took place at the turn of the 15th to the 16th century, as indicated by a Tibetan historiographic date: One of the emigrants was a pupil of Tertön Ratna Lingpa, — a famous religious scholar, who lived from 1401 to 1477 A. D.

The reasons for this exodus can only be guessed. One of the texts discovered states that the emigration took place at a time of political tension between Kham and powerful neighbours in the North, the Mongols. These had in fact undertaken several military expeditions from the Kokonor to the south. It is therefore possible that the Sherpa's ancestors left their homes under outside pressure or at least in consequence of the general unrest created by the Mongol invasions. The same motive also caused the ancestors of the royal house of Sikkim to leave Kham at nearly the same time.

It must be pointed out however that the exodus of the Sherpa's ancestors was not a mass migration involving a whole tribe. On the contrary, only a small group, consisting of four proto-clans left Kham, and this explains, why only the descendants of these proto-clans (Serwa, Minyagpa, Thimmi, Chakpa) are nowadays considered as pure Sherpa.

According to the documents the first immigrants did not proceed immediately to Solu-Khumbu, but — after their long march — they settled for a few decades in the Tinkyé area south of the Tsmomo Tretung-Lake, a region west of Central Tibet. But they abandoned their new homes again, this time disturbed by the rumors of the arrival of mighty invaders from the west. The Ruyi, an old document probably four hundred years old, calls these invaders Döhor Durkhi.

If this invasion from the west is of historical relevance at all it must be identical with the campaign of Sultan SA'ID KHAN of Kashgar and his general, MIRZA MUHAMMAD HAIDAR DUGHLAT against Tibet (1531 to 1533 A. D.). These two Mohammedan religious fanatics first marched against Ladakh and Kashmir. Later the general extended the campaign almost as far east as Lhasa and was stopped only by an outbreak of disease. HAIDAR DUGHLAT's aim, the destruction of the city temple of Lhasa and the subjection of the "Tibetan idolators", was therefore not wholly executed. His march, however, may have caused the Sherpa's ancestors to take refuge in the remote Himalayan mountains.

At any rate, the Sherpa proto-clans left the Tinkyé area, crossed a high pass called Nangpa La (5,716 m) and finally settled down in Solu Khumbu. At the time of their arrival these regions of Eastern Nepal must have been totally uninhabited. Only the southernmost parts of Solu may have been occupied by earlier settlers, the Rai. But there are no reports or other evidence of a major struggle during the following 1½ centuries. Thus the Sherpa could spread over Solu-Khumbu, unhindered by any outside power or local opponents. The story of the colonization of Solu-Khumbu is the story of the different proto-clans, their expansion and subsequent fission and the rise of independent sub-clans, which adopt new clan-names.

Thus the Minyagpa proto-clan of the Sherpa ancestors split in the course of its expansion into eight sub-clans (Gardza, Trakto, Gole, Shire, Binasa, Pankarma, Yülgongma, and Kapa). All of these immigrants came to Solu-Khumbu within the last 150 years, that is, more than 250 years after the arrival of the proto-clans. 90% of the people nowadays known as the Sherpa are the direct descendants of the proto-clans. These descendants form the social core. The other three constituents are in a way the outsiders of the society.

On a map added to Volume 8 OPPITZ recorded the migration-routes of the single clans and sub-clans, the areas of the clans, and the number of the existing households. In his publications





OPPITZ further describes the social organization and structure of the Sherpa families, the customs of the Sherpa marriage (8% of Sherpa marriages are polygamous, 5% being polyandrous, about 3% polygynous, the remaining 92% of marriages are monogamous) and concludes his book with a few oral legends and stories collected during the author's stay in Sherpa-land. The central figure of some stories is the Yeti, the fabulous "horrible snowman of the Himalayas". The Sherpa distinguish three types of Yeti, the drema (telma) or signifiers of ill omen, the chuti or murderers of cattle and the miti or robbers of humans. In the Sherpa belief, the Yeti seem to belong neither to the category of living beings such as bears, monkeys or humans, although they have certain of their physical characteristics and abilities, nor do they seem to be supernatural powers or their agents in the same sense as ghosts, deities or demons. The Yeti are believed to occupy an intermediate position.

F. W. FUNKE in Volume 9 of KHUMBU HIMAL (Contributions 2) gives a detailed description of the religious life of the Sherpa and accompanies his explanations by an appendix of pictures which, besides black-and-white ones, contains a great number of very instructive colour plates of great sociohistorical value (a total of 185 pictures). The book increases in value by an index of 72 pages in which abbreviations are used to assign the entries to the different languages (as Sherpa, Tibetan, Sanscrit, Nepali). In the single chapters on manifestations of the religious views in the Sherpa Rituals, W. F. FUNKE deals with the Nature-Spirits in Myth and Cult, the Sherpa Shamans, the Mountain-Spirits and Mountain-Gods, the gomba and the Priesthood, the Dumje Festival and Gebchi-Ritual in the service of Vegetation Powers, the Concepts of the Soul and the Ritual of the Dead, the Religious Eclecticism on Sherpa-Thankas and Tsaglis and he gives translations of Cultic Texts.

In the impassable regions of eastern Nepal, archaic religious beliefs have survived whose origins are to be sought in the pre-Buddhist period of Tibetan history. The proto-clans of the present-day Sherpa emigrated from Kham, their east Tibetan homeland and stronghold of the Bon religion, at a time when the reform of Tsong-kha-pa was reducing orthodox Lamaism to a form of rigid puritanism. The Solu Sherpa, however, have remained faithful to their ancient folk-religion down to the present day. Thus, the basis of the popular religion as practised by the vast majority of the Sherpa is still the cult of local vegetative powers. Tutelary spirits of the field and friendly vegetation powers, super-regional nature powers -- inherited from the Bon religion --, and malignant demonic spirits all appear in the myths and the cult of the Sherpa. The Bon sorcerer of primitive times survives in the institution of the Minung among the Solu Sherpa. The Minung still offers the bloody sacrifices and practises the black magic which are described by the Bon-po of earlier centuries. The cult of the mountain deities still plays a dominating role among the Shèrpa. The Sherpa cultic centre is the village temple, where only married, peasant lay-priests minister. Their main religious festivals are exclusively in honour of vegetative powers and preserve the original primitive form which, in the Tibetan homeland, has been transformed beyond recognition by the Lamaist high-religion. The author interpretes a collection of cultic images (Fig. 4) of the Sherpa to uncover their cultural and spiritual significance and evidence not only traces of the ancient, central Asiatic Bon religion but also some influences from the original Bengali region with its archaic forms of the mother cult and of the fertility and sacrificial rites.

The here chosen excerpts of papers already published show merely a part of the results of the Research Scheme. A series of various topics is still under work or just ready for printing. Thus a list of the papers already published or intended for publication is given at the end of this report. Moreover a whole catalogue of further planned work is in hand, work that continues and enlarges the studies already initiated or which deals with quite new and different problems. As a basic

of biological work at first inventories had to be made. They are indispensable for any further detailed studies on the materials collected. Ecophysiological studies shall explain the way how single species and life-communities interact with one another and how they complete with the extreme conditions of the Himalayas. A great many of questions in the field of applied biology, such as reforestation, influence of fertilizers and other problems of agriculture and stock-farming, improvement of sanitary conditions in town and country, wait still for their solution.

In order to intensify further research the ARBEITSGEMEINSCHAFT FÜR VERGLEICHENDE HOCHGEBIRGSFORSCHUNG (ASSOCIATION FOR COMPARATIVE ALPINE RESEARCH), the DEUTSCHE MORGENLÄNDISCHE GESELLSCHAFT (GERMAN ORIENTAL SOCIETY), and the SÜDASIEN INSTITUT DER UNIVERSITÄT HEIDELBERG (SOUTH ASIA INSTITUTE OF THE UNIVERSITY OF HEIDELBERG) have now formed the ARBEITSGEMEINSCHAFT FÜR NEPALFORSCHUNG (ASSOCIATION FOR NEPAL RESEARCH). The task of this Association is to warrant also the maintenance of the Nepal Research Center in the future. During the years since its foundation it became quite evident how much the existence of this institution was beneficial. It facilitated initiation and progress of every work, and fostered and stimulated a fruitful exchange between the single scientists and the disciplines as well. In this way it has been tried again and again to realize and to deepen also the exchange with Nepalese institutes and scholars. We would especially like to thank Mr. B. G. KALIKOTE for all his pain-staking care in conducting the affairs of the house and in attending so kindly and untiringly his numerous guests.

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# KHUMBU HIMAL

## ERGEBNISSE DES FORSCHUNGSUNTERNEHMENS NEPAL HIMALAYA

Herausgegeben

von PROF. DR. W. HELLMICH

### I

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