



# 横断山区自然地理

中国科学院青藏高原综合科学考察队

青藏高原横断山区科学考察丛书

# 横断山区自然地理

中国科学院青藏高原综合科学考察队

张荣祖 郑 度 杨勤业 刘燕华

**主持单位**

中国科学院地理研究所

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## 内 容 简 介

本书是青藏高原横断山区科学考察丛书之一。它是在多年野外考察的基础上并参考分析与研究了已有的有关著作,对横断山区的自然地理作了全面系统的阐述,全书共分九章,内容包括横断山区自然地理概论、地形、气候、河流与湖泊、植被、动物、土壤、自然地理区划与分区等。

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THE SERIES OF THE SCIENTIFIC EXPEDITION TO HENGDUAN  
MOUNTAINS, QINGHAI – XIZANG PLATEAU

**PHYSICAL GEOGRAPHY OF  
HENGDUAN MOUNTAINS**

The Comprehensive Scientific Expedition to the  
Qinghai-Xizang Plateau, Chinese Academy of Sciences

*by*

Zhang Rongzu (Zhang Yougzu), Zheng Du, Yang Qinye, Liu Yanhua

*Directed by*

Institute of Geography , Chinese Academy of Sciences

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## 《青藏高原横断山区科学考察丛书》顾问

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## 《青藏高原横断山区科学考察丛书》序

辽阔的青藏高原,包括西藏全部、青海南部,以及四川西部和云南西北部。大部分地区海拔在4 000米以上,四面以巨大的落差急剧下降,衬托出世界屋脊的磅礴气势,素有世界第三极之称。由于青藏高原独特的地质历史和自然条件,丰富的生物组成和生物群落类型,成为地球上一个独具特色的地理单元。青藏高原蕴藏着丰富的自然资源,又是许多少数民族生活和居住的地区,且地处边陲,合理保护和开发这一地区的自然资源,对发展经济、改善人民生活,以及巩固民族团结和加强国防建设都有重要的意义。

为了探索青藏高原形成和演变的历史,研究自然条件的特点及其对周围环境的影响,研究自然资源的数量和质量及其合理开发利用的途径,解放以后,中国科学院对这里进行了多次科学考察;特别是自1973年起组织了青藏高原综合科学考察队,对这一地区进行了更为全面、系统的综合性研究。

1973—1980年期间,考察队重点对西藏自治区进行了考察。其科学成果将集中反映在陆续出版的《青藏高原科学考察丛书》(西藏部分)及论文集和画册中。有些成果在实际生产中已得到推广和应用,在国际和国内产生了深远的影响。

考察队从1981年起将考察研究的重点转移到横断山区。横断山地处我国西南的藏东、川西和滇西北一带,是青藏高原的一个组成部分。在行政区域上包括西藏自治区的昌都地区,四川省阿坝、甘孜、凉山及云南省丽江、迪庆、怒江和大理等地(州)区,总面积约50万平方公里。

横断山脉在地质构造上处于南亚大陆与欧亚大陆镶嵌交接带的东翼,是我国东部环太平洋带与西部古地中海带间的过渡地带,地质构造复杂,新构造运动活跃。本区地势由西北向东南倾斜,大部为高山峡谷,山脉、河流南北纵贯,相间并列,高差很大,自然地理条件独具一格,生物区系绚丽多采,且富含古老和孑遗类型,是研究生物和地学中许多重大理论问题的关键性地区。

横断山脉自然资源丰富,尤以多种矿产、水利、森林、草场等资源最为丰富。但是随着人口的增长和开发利用的加剧,自然资源承受的人类压力日益加大,有些地区生态平衡遭到了破坏。为了合理利用自然资源,必须研究本区的自然资源特点,探索其合理保护利用与开发的方向和途径。

横断山区科学考察工作主要围绕六个课题进行:(1)横断山脉形成的原因和地质历史;(2)横断山区自然地理特征及其与高原隆起的关系;(3)横断山区自然垂直地带的结构及其规律;(4)横断山区生物区系的组成;(5)横断山区自然保护与自然保护区;(6)横断山区自然资源的评价及其合理开发利用。

为了使科学考察研究更密切地与当地的经济开发工作结合起来,在自然资源评价与开发利用方面着重抓了农业自然资源条件与自然资源系列制图、亚高山暗针叶林采伐与更新、地方能源的综合利用、畜牧业发展战略及干旱河谷农业自然条件与开发利用等五项综合专题的考察研究。

横断山区的综合科学考察研究工作由中国科学院-国家计划委员会自然资源综合考察委员会负责组织领导。参加此次考察研究的包括中国科学院有关研究所、高等院校和地方科研与生产部门等单位计 40 余个,约 300 多人,涉及 40 多个专业。

《青藏高原横断山区科学考察丛书》将系统地总结青藏高原综合科学考察第二阶段的成果。

《青藏高原横断山区科学考察丛书》计划由 39 部计 48 册专著组成。我们希望它能在探索青藏高原的奥秘和我国社会主义建设中发挥积极的作用。

中国科学院青藏高原综合科学考察队

# THE SERIES OF THE SCIENTIFIC EXPEDITION TO THE HENGDUAN MOUNTAINS OF THE QINGHAI-XIZANG PLATEAU

## PREFACE

The vast Qinghai-Xizang Plateau, consisting of the Xizang (Tibet) Autonomous Region, the southern part of Qinghai Province, western part of Sichuan Province and northwestern part of Yunnan Province, is often eulogized as the third polar of the world. The major parts of the Plateau are 4 000 metres above sea level, while the areas around drop drastically setting off the tremendous momentum of the roof of the world. The particularities of the geological history and physical conditions, the variety of biological composition and the different types of bio-communities make the Qinghai-Xizang Plateau a unique geographical unit. As the Plateau, being rich in natural resources, lies on the border regions where inhabit many national minorities, the rational conservation and utilization of the natural resources in this region are of particular importance in developing economy, improving the local livelihood and consolidating national solidarity as well as strengthening national defence.

Ever since the foundation of new China, many scientific surveys have been carried out in this region so as to make a better understanding of the history formation and evolution of the Qinghai-Xizang Plateau, to study the characteristics of its natural conditions, their effects on the environment around and the quantity and quality of the natural resources and thus, to find a way of exploiting and utilizing them rationally. Especially after the forming of the Comprehensive Scientific Expedition to the Qinghai-Xizang Plateau in 1973, an even more comprehensive, systematic integrated research has being made in this region.

A survey was mainly carried out in the Xizang (Tibet) Autonomous Region during the period of 1973—1980. The scientific findings of the survey, part of which have already been extended and applied to actual production and have brought a far-reaching influence both in and outside China, will be concentratedly compiled in the series of scientific survey on the Qinghai-Xizang Plateau (Xizang Volume), proceedings and pictorials.

Since 1981, the survey team has shifted its major researching area to the Hengduan Mountainous Region which is a constitutional part of the Qinghai-Xizang Plateau and is located in the east of Xizang, west of Sichuan and northwest of Yunnan in southwest China. The total area of this region is about 0.5 million square kilometres, and administratively speaking, it includes the Changdu District of Xizang, Erba, Gangzi, Liangshan of Sichuan and Lijiang, Diqing, Nujiang and Dali districts of Yunnan.

The Hengduan Range is complicated in geological structure and active in new tectonic movements. It lies on the east flank of the juncture area where south Asia and Eurasia are mounted. It is the transition region between the east zones encircling the Pacific and the west zones of ancient mediterranean. The altitude of this area declines from northwest to southeast. Most parts of the area are characterized by a series of paralleled mountain ranges and rivers from south to north, and with a sharp altitudinal differentiation. Its unique physical conditions and various ecosystems rich in flora and fauna with abundant relic species, give the area a critical nature for the fundamental research in the field of biology and earth science.



The Hengduan Mountainous Region is abundant in natural resources, among which multi-mineral products, hydrological resources, forest and grasslands accounts for the great part. But with fast growth of the population and an extensive exploitation and utilization of the natural resources, the human pressure on natural resources has vastly increased which even caused librium damagement in some parts of the area. In order to make a more reasonable utilization of natural resources, it is necessary to study the characteristics of the resources in this region so as to work out certain ways and methods for protecting ,utilizing and exploiting them rationally.

There are six major subjects in the research work being carried out in the Hengduan Mountains:

1. The geological history of the Hengduan Range;
2. The physiographical characteristics of the Hengduan Mountains and their relationship with the rise of the Plateau;
3. The structure and rule of the altitudinal belts of the Hengduan Mountains;
4. The composition of bio-communities in the Hengduan Mountains;
5. The natural conservation and nature reserves in the Hengduan Mountains;
6. Evaluation of the natural resources in the Hengduan Mountains and their rational development and conservation.

Five integrated projects have also been given special attention in the research on natural resources evaluation, exploitation and utilization. They include as following: compilation of a series of maps on the conditions of agricultural resources; deforestation and regeneration of subalpine coniferous forest in subalpine areas; the multiple utilization of local energy resources; strategy for the development of animal husbandry and finally the management of the natural resources in the arid valleys. This has been done in line with the purpose of linking scientific research closely to the development of the local economy.

The integrated survey on the Hengduan Mountainous Region is organized by the Commission for Integrated Survey of Natural Resources under the Chinese Academy of Sciences and the State Planning Committee. There are more than 300 people, coming from more than 40 institutions including different institutes of the Chinese Academy of Sciences, universities and local scientific research and production departments engaged in natural resources research. A series of scientific publications on the Hengduan Mountains will provide the results acquired from the second phase of the integrated scientific survey in the Qinghai-Xizang Plateau. It is designed that this series will consist of 39 volumes and 48 monographs. It is also expected that this series will play an important role in exploring the wonders of the Qinghai-Xizang Plateau and in the construction of China.

The Comprehensive Scientific Expedition  
to the Qinghai-Xizang Plateau,  
Chinese Academy of Sciences

# PHYSICAL GEOGRAPHY OF HENGDUAN MOUNTAINS

## (Abstract)

Customarily, eastern Xizang (Tibet), Western Sichuan (Szechuan) and western Yunnan, the area which lies approximately between longitudes  $97^{\circ}(98^{\circ})$  E and  $103^{\circ}$  E and latitudes of  $23^{\circ}$  N and  $33^{\circ}$  N, can be treated as one unique geographic region characterized by formidable parallel high mountain ranges and deep gorges that are aligned stretching roughly north – south. It has a total area of about  $4.2 \times 10^5 \text{ km}^2$ . The Chinese name for this region is “Hengduan Shan” which means “traverse cutting mountains”. Early Chinese geographers explained that most of the mountain chains of Asia exhibit a predominant west – east trend; the system of the Hengduan Mountains is exception because of its north – south trend.

It forms a considerable barrier to communication between the people of the Tibetan Plateau and those of the Sichuan Basin. This barrier effect was especially considerable before the 1950s when travel depended entirely on tortuous mountain trails and rope bridges or iron suspension bridges.

From a geological point of view, the name of Hengduan Shan is particularly appropriate to that section known as the “three river gorges country” on the frontier between Xizang, Sichuan and Yunnan. It was recognized as a specific geological region and called “Sanjiang (three rivers) area”, characterized by a very obvious arcuate structural frame. This coincides geomorphically with the area of parallel ridges which separate the three mighty rivers, Nujiang, Lancangjiang, and Jinshajiang, the latter represents the upper reaches of the Changjiang (Yangtze). This remarkable structural and morphologic characteristics may be unique in terms of large scale geological systems as well as the river patterns of the world. Because of great similarity in geological structure, the upper reaches of the Irrawaddy to the southwest and the Yuanjiang to the southeast must be incorporated as the southern extension of this Hengduan geological region.

However, topographically the area from the Jinshajiang to the east, western Sichuan, formerly Sikang, which is occupied by the drainage basins of the Yalungjiang and Daduhe, the tributaries of the Jinshajiang, and further east to the Min River, are usually described separately as a geomorphological region called the “West Sichuan Highland”. This area is also considered characteristic of the landscape of the river gorge region. Nevertheless, it possesses a little different geological history and fundamental structure. Broad topographical affinity is the basis for the traditional concept of the Hengduan mountains and for the inclusion of the geographical region including “Sanjiang Area” (geologically) and the “West Sichuan Highland”, as the eastern margin of the Tibetan Plateau.

Nevertheless, because the region has such great geographical extension, from the tropic of cancer to the north covering an area of more than ten degrees of latitude and six-seven degrees of longitude, to treat it as a single geographical region from topographical considerations, seems an oversimplification. In fact, it is known that the region exhibits a great climatic and biogeographic heterogeneity, even the topography itself which shows regional differentiation. Thus a division into distinct subregions is necessary in each aspect of physiogeographical elements.

In general, most mountain chains of the Hengduan region correspond to the geological structure which emphasizes especially the ranges and gorges landscape. Except for the upper reaches of the three main rivers, most parts of the gorge area are characterized by rugged mountains of very pronounced relief, valley floor to ridge crest elevations range from 800 – 1 000 m in the north and 1 500 – 2 500 m or more in the south. Western Sichuan and the adjacent areas of northern Yunnan to the

south are characterized by much more varied topography. The plateau-type landforms are remained extensively and stretch northward to unite with the Tibetan Plateau proper. Many of the highest peaks of this area exceed 6 000 m, The most conspicuous massif is the Gongashan (Gongkar), which is situated 80 km to the west of Kantin (Tatsienin), and recently has been the objective of many mountaineering expeditions and tourism. According to the macro-geomorphological characteristics of the area three geomorphologic subdivisions can be recognized.

Because of its topographical situation as the eastern dissected rim of the Tibetan plateau, climatologically, the Hengduan region is a transitional zone between the lowland tropical and subtropical climate in the southeast to the highland climate of the plateau itself in the northwest. The Hengduan region correspondingly displays a wide variety of mountain topoclimate, but all are mainly influenced by the southwest Asian monsoonal rhythm which is known to be characterized by the seasonal alternation of wind systems. A recent study has suggested that the Tibetan Plateau has its own permanent pressure system which is also marked by change in the prevailing wind direction between winter and summer, this has been described as an independent plateau monsoon system. This system dominates the weather and climate of the plateau proper and may cause some deviation from average Asiatic monsoonal conditions in the adjacent areas including the Hengduan Mountains. The complex local patterns of mountain climate make the Hengduan region difficult to present any systematic regionalization, nevertheless, the well-marked horizontal zonation in temperature associated with other climatic characteristics allows the Hengduan region to be divided into seven climatic regions.

The Hengduan Mountains is the most intensive river area of China. Those of the rivers belong to two major water system. One is of Pacific Ocean river-system, which includes the Changjiang (Yangtze River), Huanghe (Yellow River), Lancangjiang and Yuanjiang. The other is of India Ocean river-system which includes Nujiang. The drainage patterns of the rivers in the region are strongly controlled by geological structure and creat a feature which is far from the normal drainage system. The deep-cutting parallel main courses, as well as the "zigzag" turning channel and the "feathered" pattern of the tributaries, are developed along geological fault structures. Generally, on the basis of the characteristics of river runoff which expectedly is correlating rather well with the regional and seasonal variation of precipitation in the region, five types of river have been distinguished.

Biogeographically, the Hengduan Region itself is characterised by vertically diversified habitats in relation to the complexity of deep gorges and high mountain environment, Furthermore, the south-north trend of the ranges and gorges have facilitated the exchange of the elements of flora and fauna between south and north during a long period of geological time. Thus, apart from characteristic of regional endemism, the Hengduan Region exhibits a mixed floristic and faunal composition and obviously vertical zonation. There are seven vegetation formations and five vegetation regions with distinctively variety vertical zonation and three faunal regions have been recognized. During the Pliocene, the northwards or southwards shift of climatic zonation in the eastern China, caused by the movements of glaciations, which may be measured in scale of kilometers, while in the Hengduan region as an area of gorges and ridges in pronounced relief, the vertical change of climatic belts must be measured only in scale of meters. Thus, the Hengduan area has provided favourable mountain environment with vertical heterogeneity for the species of different ecological groups to find refuges in one hand and to lead a phylogenetic diversity in the other. In result, the Hengduan mountains are rich in relic species and form the contemporary centers of some groups.

The forming processes of soil developed in the Hengduan mountains are much influenced by the coincide effects of vertical and horizontal zonation of biophysical environment. The distribution pattern of the major soil types reflected the same tendency of regionalization of climate and vegetation. The main soil types recognized in the region can be grouped into four major soil regions.

Based on a point of view of integrated physiogeography as well as the landuse patterns, two natural regions and nine sub-regions have been proposed.

## 前 言

习惯上,所谓横断山区,包括四川西部和云南西部。“横断”一词,源自我国早期地理教科书(邹代钧,1900—1901)<sup>①</sup>,其含义未见专门解释,但地理学前辈在描述本区山川形势时,均特别指出,亚洲的主要山脉,大体呈东西走向,唯有这一地区,众山齐骈,呈南北走向,在地势图上,纵贯横切之势,十分明显(见第二章图 2-1)。本世纪 50 年代以前,视为交通上之绝境,人畜渡江,仅靠铁索桥或吊绳,跨越急流峡谷,惊心动魄。至今虽有现代化桥梁,但峻岭陡壁间之盘山公路,仍是险途。

横断山区自然资源丰富,农业开发历史甚早。在云南部分于隋唐时期(6—8 世纪)种植业已开始得到稳定发展,到明清时期(14—19 世纪),种植业扩展至本区的西部与中部即四川西部,在北部以青稞和牦牛为主的半农半牧区内,种植业也有所发展(中国科学院地理研究所经济地理研究室,1980),近几十年来,随着人口的增加和对自然资源开发利用的加剧,自然环境承受的压力,日益加重。有些地区生态平衡遭到了破坏,严重的水土流失,还危及下游地区。因而,研究本区的自然地理,对探索合理利用本区自然资源与进一步开发的方向与途径,具有重要的意义。

自 1981 年至 1984 年,本组考察的范围,几乎遍及全区。本专册除基于本组考察所获还参考了已发表和部分未发表的有关文献。笔者旨在为有中专水平以上的广大地方干部和地理专业人员提供一个简要但比较全面的关于本区自然地理的基础知识。

本书共分九章,各章节执笔人分工如下:

前言

第一章 前人对横断山区自然地理的认识:张荣祖

第二章 自然地理概论:张荣祖

第三章 地形:张荣祖

第四章 气候:杨勤业

第五章 河流和湖泊:杨勤业

第六章 植被:郑度

第七章 动物:张荣祖

第八章 土壤:刘燕华

第九章 自然区划:杨勤业、郑度、刘燕华、张荣祖

本书由张荣祖统稿,初稿完后承李炳元等同志审阅,附图由陈俊华清绘;土壤标本承中国科学院地理研究所中心分析室分析;野外工作中除本队各兄弟组的配合,还得到四川和云南两省有关领导和各地区政府的大力支持和协助,中国科学院成都山地灾害与环境研究所提供了该所若干未刊的资料,笔者对此深表感谢。

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<sup>①</sup> 引自陈富斌,“横断山脉”一词的由来,山地研究,2(1)31—35,1982。

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# 第一章 前人对横断山区自然地理的认识

在我国最早的两部地理著作《山海经》与《禹贡》(公元前 200 余年至 400 余年)中,都述及本区的岷山。这大概是最早的有关本区自然地理的记载。其后在东汉(公元 25 年至 220 年)的《汉书·沟洫志》与《汉书·地理志》中,分别有岷江水系及都江堰灌渠和金沙江水系的记述。由于本区山川险峻,在古代交通极为不便,自公元后千余年间,古人对本区的了解,远不及对我国西北(西域)和青藏地区。直至 17—18 世纪,由于政治经济与交通往来的增多,对本区的地理知识,才有较多的增长。当时,由于资本主义萌芽,一些启蒙运动的学者,倡导实际考察。我国著名地理学家徐霞客就是代表之一。他于 1635 年(明崇祯九年丙子),开始历时 4 年的“万里遐征”,从他家乡江苏江阴出发,经江西、湖南、广西、贵州而至云南。在云南境内,他两次穿越横断山区中南部,自金沙江(丽江地区)跨澜沧江、怒江而至本区西南端的腾冲地区。他对所经各地的地形、水系、喀斯特地貌、地热、植被与动物等,均有细微生动的描写。如对腾冲境内的一死火山,他写道“(打鹰山)……山顶之石,色赭赤而质轻污,状如蜂房,为污沫结成者,虽大至合抱,而两指可携,然其实仍坚,真劫灰之余也”。对腾冲之地热亦有颇详实之记载。由于他观察了云南境内的金沙江,了解到长江接受的水,远远超过黄河,并纠正了相沿已久的长江发源于岷江的错误认识。他写下了著名的《溯江纪源》,辨明长江的正源是金沙江而不是岷江。他写道:“岷江经成都至叙(宜宾)不及千里,金沙江经丽江、云南乌蒙至叙,共二千余里”,“岷之入江,与渭(渭河)之入河(黄河)”一样是“支流”而已,“故推江源者,必当以金沙(江)为首”。他对龙川江与澜沧江、元江上游礼社河亦有考证。又如他对点苍山顶植被的描述,颇细致地观察到小地形的影响,他写道“顶皆烧茅流土,无复棘翳(树灌);惟顶坳间,时丛木一区,棘翳随之”。对动物的分布,他记述了“顺宁(今凤庆)以南多象”,“鹤庆以北多牦牛”(中国科学院自然科学史研究所地学史组,1984)。在清康熙与乾隆年间分别有《云南通志》与《滇黔志略》涉及本区。

19 世纪至 20 世纪初,直到 1949 年中华人民共和国建立前,由于我国在政治上沦为半封建、半殖民地国家,百多年间,政治不稳定,经济落后,国人对本区的科学调查研究,反而不及外人。据粗略统计(施白南等,1982),自 1868 年法国传教士戴维(David, A.)到本山区宝兴采集动物起到 1938 年抗日战争初期,美国芝加哥博物馆在汶川运走活熊猫时止的 70 年间,先后有法、俄、奥、瑞典、英、美、日等国组织调查队在本区或邻近地区长期(数年)、短期或分期连续十多年,进行生物采集与考察,对本区自然地理知识,不断累积,其中以英人瓦特(Ward, F. K.)最为突出。他除采集生物,对地质、地形、冰川、水文、气候与少数民族社会经济等均进行考察,被称为是在横断山区和东喜马拉雅山区高山峡谷之乡渡过毕生事业的人物。他写下了数以百计的札记与文章。他写的考察专册《蓝罂粟之乡》(The Land of the Blue Poppy, 1913),《西藏神秘之河》(The Mystery River of Tibet, 1923),和《从中国到康底龙》(From China to Hkamtilong, 1924)都详细地描述了北自巴塘南至高



黎贡山南部的植被、气候、地形、冰川、地质和民族。他对本区的干旱河谷现象甚感兴趣。他还识别出本区地形上的三个主要类型,即V形谷、U形谷和高原面的成层分布(Schwein-furth, 1975)。他认为怒江与澜沧江分水岭是印度与中国亚区生物区系的分界线。不过,他当时提出的一些代表动物的分布,如象、小熊猫、叶猴、长臂猿等不见于此线以东即高黎贡山以东的说法并不正确。一些国外的地质、地理学者,在此时期亦有许多工作,出版了一些著作,比较重要的有劳兹(Loczy, L. V.)的《东亚西康省旅行科学成果》(1893)、戴维斯(Davies, H. R.)的《云南》(为1894—1900的考察成果)、汉姆(Heim, A.)的《四川—西藏考察》(1930)、戴普拉(Deprat, J. A.)的《云南地质》(1912)和格利高利(Gregory, J. W., 1923)的《中国西藏之阿尔卑斯》等。值得提出的是劳兹绘制的康定至巴塘地形地质剖面图(1893)和汉姆绘制的贡嘎山冰川分布图(1936),至今仍有重要参考价值<sup>①</sup>。本区南北向的河系及金沙江水系的“之”字形大弯曲,早就引起在本区考察的外国学者的注意,和本区河流大袭夺历史的见解(Deprat, 1912; Gregory, 1923; 沈玉昌等, 1963)。

来我国建立广州国立中山大学地理系的德国地理学家克勒脱纳(W. Credner)于1930年曾带领学生至云南考察地理,以大理为中心并西行穿过横断山区至怒江再北上至金沙江再返回大理,他在点苍山(4122米)3900米以上发现了冰川地形和第四纪冰川遗迹。他与我国著名地理学家林超教授(当时中大地理系助教)首次提出“大理冰期”的概念,至今已为我国及国外学者广泛使用。克勒脱纳还记述了考察地区的其他地形地质情况,如古生代灰岩高原、二叠纪红层及其地形、怒江花岗岩体、滇西火山群等。他还提出滇西一带地形是褶皱后被夷平的地面,第三纪后期,准平原面上升成高原,河流下切成峡谷,这一观点直到以后的综合考察,大体乃得到相似结论,他的考察成果汇在他著的《1931年云南地理考察报告》<sup>②</sup>中。所以他以先驱的作用,对本区地理学发现有重要的贡献。

近代国内学者对本区的实地考察,较晚于外人,在本世纪的20年代后期才逐渐开始。那时我国新科学的启蒙者,不甘本地区科学考察为外人所垄断,鼓励对我国自然资源丰富的西部地区进行考察。另外,英、法、俄等国对我国云南,原西康、西藏等边疆地带怀有野心的形势,亦刺激国人对本区的关怀。后来,抗日战争爆发,四川、云南成为抗战的大后方,当时开发边疆资源,沟通与缅甸、印度之交通,均属当务之急。国内学者亦集中于此,故对本区的生物、地质和地理的实地考察有所促进。有些著作可视为该时期的代表,如任国强(1942)的《康藏史地大纲》,是十余年考察的成果。此书对西康五大河谷之山川、气候、主要物产,以及高度对农业的影响均有记载。他的另一著作《西康图经·地文篇》(1935),则专述山川地形;梅心如(1934)著的《西康》、李亦人(1940)著的《西康综览》,杨仲华(1929)著的《西康纪要》、翁之藏(1929)著的《西康之实况》,郭垣(1940)著的《云南省之自然富源》等,均属实地考察之著。各书虽偏于人文、沿革或物产,但对各地山川气候等自然地理均有概要的叙述。1934年由前中央大学地理系组织的云南地理考察,是专业性的,有我国地理学前辈黄国璋、严德一,还有奥地利地理学家费师孟(Wissmann, H. V.)等参加。严德一后来还四次参加了本区边疆地区的考察。他的考察成果,后来汇集于他写的《边疆调查实录》(严德一, 1950)中。他在本区涉足北至昌都(并远及青海)、南抵云南西

① 柴宗新, 1980, 横断山地区地理资料:地貌部分, 成都地理所, 未刊。

② 报告全称为《1931年云南地理考察报告》刊“国立中山大学地理系报告集刊”, 第1卷, 第1、2期, 1931年。