

Stockholm, November 11, 2009

*The Role of Central Asia
in the Discovery
of Global Warming*

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Our camp at Baller on the Obain-gol was guarded by mighty poplars *Bortman Photo*

Lecture outline

1. Central Asia as pivot of world history: Halford Mackinder (1904)
2. The theoretician of climate as pivot of civilization: Ellsworth Huntington (1907)
3. First attempts at documenting climate change in Central Asia: Aurel Stein and Sven Hedin's surveys (1903-1908)
4. New attempt at documenting climate change in Central Asia: the Sino-Swedish Expedition (1927-1935)
5. Refutation of concept, fieldwork and individuals by the geography community

Introduction

This paper on the history of a concept – global warming – will analyze the role that Central Asia took in a scientific debate.



Geologists, geographers and archaeologists extensively studied places like Kara Khoto, Lop Nor and Seistan between 1903 and 1935. They believed that maps and fieldwork results could feed the discussion held at the Royal Geographical Society of London on climate change.

I will examine with you the data collected by these field scholars as they tried to grasp the terms of long-term sustainable development in a forbidden environment.



The environment of Central Asia has changed so dramatically since the Cretaceous period that the previously subtropical region is now experiencing the most continental climate on this planet. What NASA has called the most degraded landscape on Earth used to provide the resources of the flourishing oases of the Silk Road. Agriculture and trade declined after the 15th century.

Mapping what happened to the oases, rivers and terminal lakes would help understand how local communities adjusted to life-threatening changes. To comprehend scientific controversies on “the geographical pivot of history,” I will propose a short account of the remarkable expeditions that explored the Gobi, Taklamakan, Qinghai and Kevir deserts.



See Photo
Curiously shaped mesa fragment to the east of the Lop-nor depression, Dec. 10th 1934. Observe the man standing half way up to the right.

The review of precise field maps and photographs should help me reconstruct not only the environmental and cultural history of the region, but also the scholarly debate on climate that occurred during the first three decades of last century. I will very specifically investigate expedition reports because these publications exemplify the methodological guidelines enforced by the scholarly community. I will indeed argue that Stein's Explorations in Turkestan or Hedin's Sino-Swedish "Scientific Expedition to the North-western Provinces of China" provide a useful framework to analyze the first debate on global warming.



A camping place in the Lang-shan

Reynold Photo

The scientists active in Central Asia in the early 20th century

1893-1897, 1899-1901, 1905-1908:

Sven Hedin (Sweden)

1900-1901, 1906-1909, 1913-1915:

Aurel Stein (British India)

1903 and 1905-1906: Ellsworth

Huntington (USA)

1907-1909: Piotr Kozlov (Russia)

1921-1930: Roy Chapman Andrews
(USA)

1926-1928: Wilhelm Filchner
(Germany)

1927-1935: Folke Bergman, Erik Norin,
Nils Hörner, Parker Chen and the
other members of the "Sino-Swedish
scientific expedition to the North-
western provinces of China under the
leadership of Dr. Sven Hedin."

IS THE EARTH DRYING UP?*

By Prof. J. W. GREGORY, D.Sc., F.R.S.

10. CENTRAL AND WESTERN ASIA.

When we pass from Europe and the maritime countries of the Mediterranean into central Asia there appears much striking evidence of climatic change. It is true that Biot, in 1841, in a memoir on the ancient temperature of China, concluded from the same plants having been cultivated in the Hoango Ho valley and silkworms having been hatched and birds having arrived and departed at the same dates as at present, that the climate of China has undergone no sensible change during the past three thousand years. In central Asia, however, there is abundant evidence of the lapse of fertile into arid lands. Lakes and inland seas have been reduced in size and number; rivers have a lesser volume of waters; once busy towns have been abandoned and their ruins smothered by sand; wide tracts of country have passed out of cultivation and been abandoned by their inhabitants; and routes crossed by ancient armies are said to be now impassable except to small caravans. There is such general agreement amongst Asiatic travellers as to the widespread distribution of these changes that Hann has felt compelled to accept the increasing scarcity of water on the highlands of central Asia as "scarcely doubtful" (1908, Vol. 1, p. 352). Nevertheless there are emphatic statements to the contrary. Thus, to quote Prof. Huntington's statement of the views against his conclusion, Sven Hedin "scouts the idea of any change of climate during historic times" (Huntington, 1907, 2, p. 142); and he cites one school, as holding that "the climate of Persia has remained practically unaltered throughout historical time" (Huntington, 1905, p. 308).

The distinguished Russian geographer, Berg, is most emphatic that the evidence advanced as proof of recent changes of climate in Asia should be otherwise explained, and that "the desiccation in central Asia had already come to an end in prehistoric times" (1907, p. 569).

The view that the climate of central Asia is growing drier was advocated forty years ago by the late Dr. W. T. Blanford on evidence from Persia, and this view has been adopted by many later travellers. He urged (1873, p. 500) that there has been "a gradual change in the climate of central Asia . . . from the time when the great plain north of Persia was under water," and that "to a gradual reduction in the rainfall in modern times is probably to be attributed the circumstance of the Oxus no longer reaching the Caspian, and the diminished volume of that river." Blanford's conclusion has been rejected by von Richthofen (1877, vol. 1, p. 174) and E. Tietze (1877, p. 341), who attribute the supposed lake deposits to the action of the wind. Nevertheless it appears most probable

The Royal Geographical Society, through its lecture series and discussions, and the *Geographical Journal* were the two venues that mattered for a lively debate of new ideas.

"The desiccation of Eurasia" discussion was initiated in 1904 by Piotr Kropotkin and revisited in 1914 by J.W. Gregory. Albrecht Penck summarized and closed the debate in 1930: "There can be no doubt of the persistence of desert conditions."

* Continued from page 172.

The Geographical Journal.

No. 4.

APRIL, 1904.

VOL. XXIII.

THE GEOGRAPHICAL PIVOT OF HISTORY.*

By H. J. MACKINDER, M.A., Reader in Geography in the University of Oxford; Director of the London School of Economics and Political Science.

WHEN historians in the remote future come to look back on the group of centuries through which we are now passing, and see them foreshortened, as we to-day see the Egyptian dynasties, it may well be that they will describe the last 400 years as the Columbian epoch, and will say that it ended soon after the year 1900. Of late it has been a commonplace to speak of geographical exploration as nearly over, and it is recognized that geography must be diverted to the purpose of intensive survey and philosophic synthesis. In 400 years the outline of the map of the world has been completed with approximate accuracy, and even in the polar regions the voyages of Nansen and Scott have very narrowly reduced the last possibility of dramatic discoveries. But the opening

In the lecture he gave on January 25, 1904 at the Royal Geographical Society of London, Mackinder warned that a coalition between China and Russia, based on the new railroads that crossed Central Asia, would endanger the world's freedom. Despite the lecture title, the audience remained unconvinced of the new importance granted by Mackinder to Central Asia.

Mackinder placed Central Asia at the heart of his map to illustrate the fundamental dependency he saw between physical geography and state formation in the margins of the “heartland.”

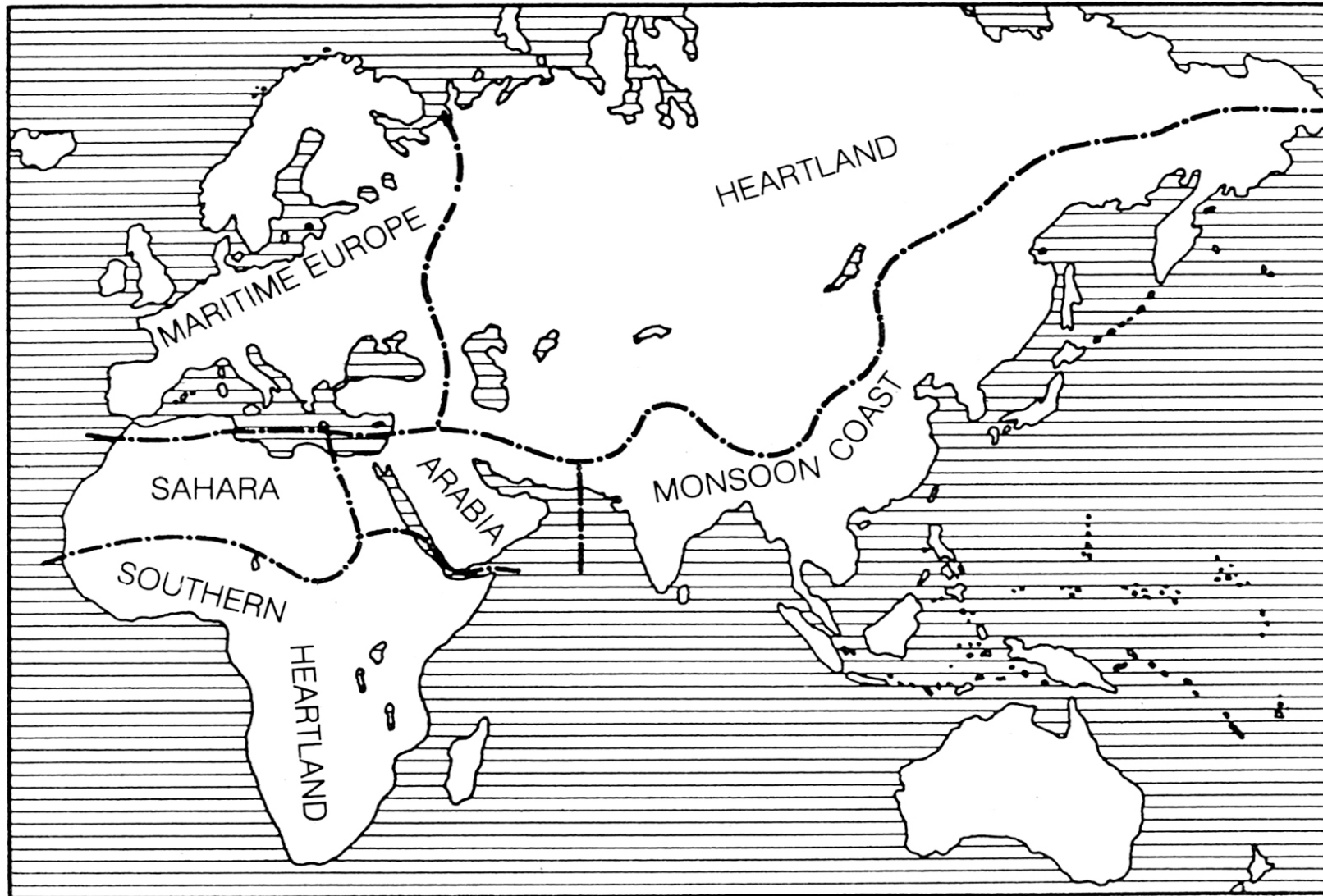
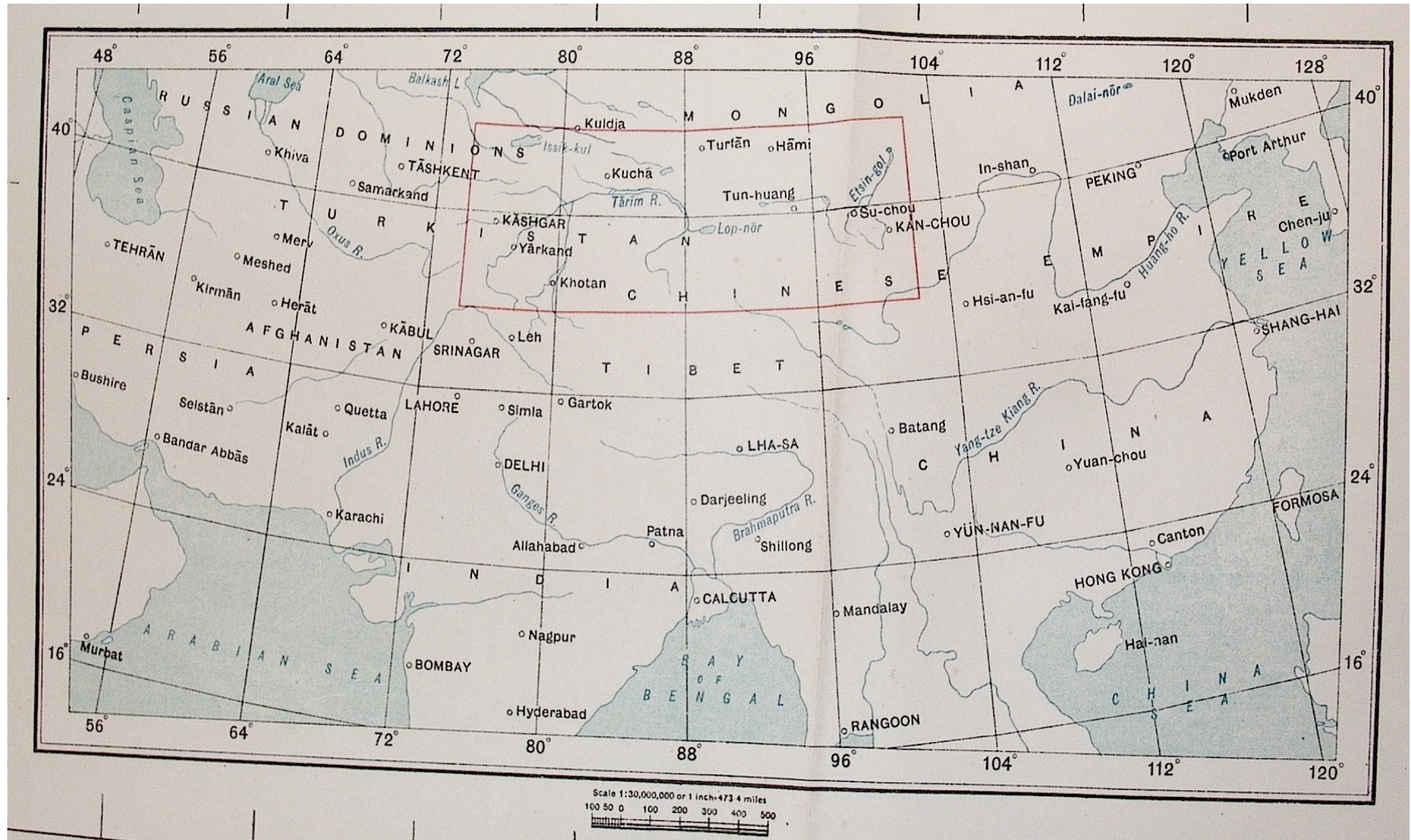
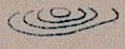
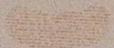
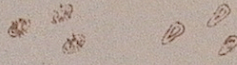
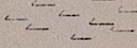
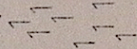
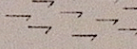


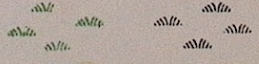
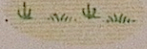
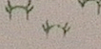

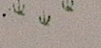


Figure 19. Mackinder's "World Island" with his sub-division in regions as he saw them from his strategic standpoint.

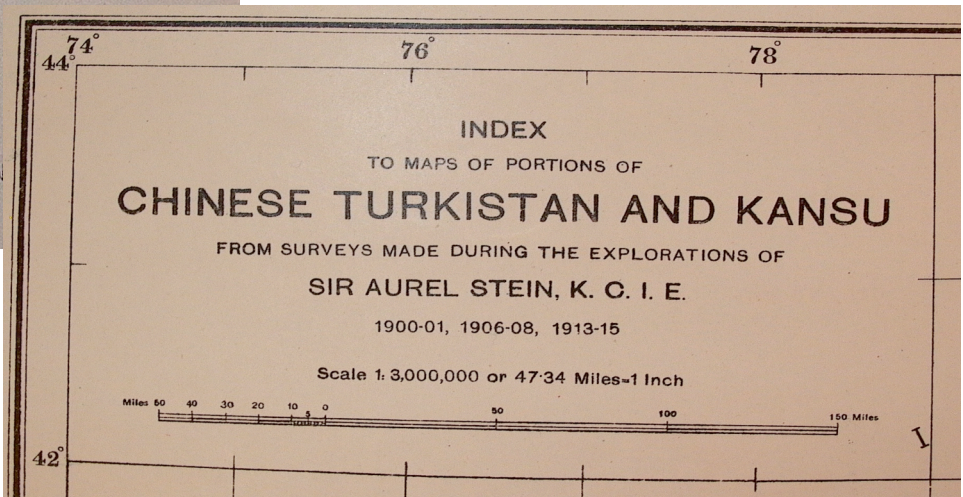
The subcontinent became for three decades a new terrain to test theories in the sciences, such as the origin of the white man, the fate of ancient civilizations, and the nature of climate change.

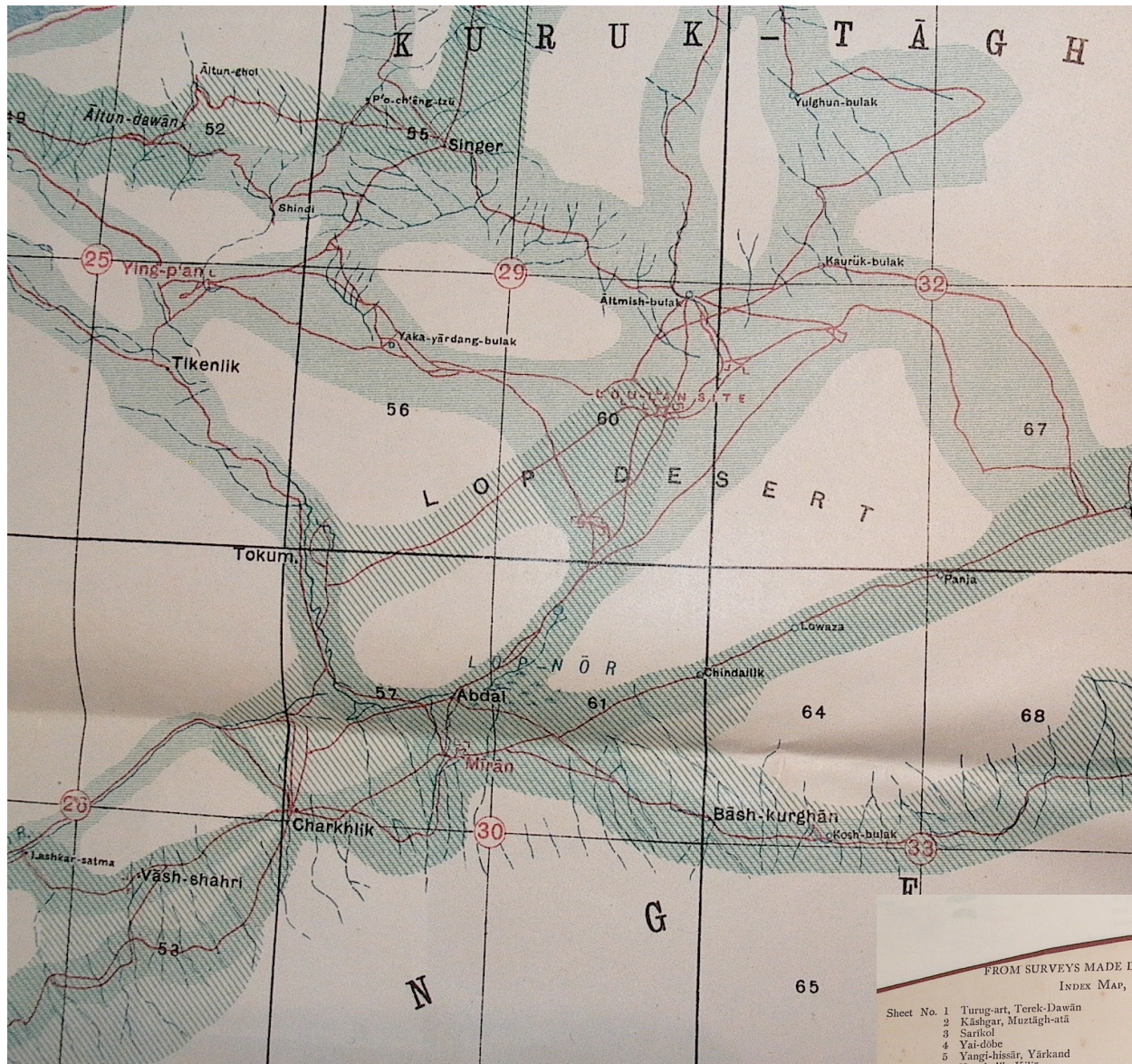


Latitude Stn. Azimuth Stn. Triangulation Stn.....	⊕	⊙	△
Heights: by theodolite; by clinometer.....	13277	.	12300 c
Heights: by barometer or hypsometer.....	12770		
Perpetual snow (approximate).....			
Drift-sand area.....			
Erosion terraces: Mesa; Yārdang.....			
Hard salt crust.....			
Hard salt-encrusted clay.....			
Soft salt-encrusted clay.....			
Cultivation: unsurveyed.....			
Edges of cultivation, etc., where surveyed.....			
Reeds or low scrub: living; dead.....			
Sandy tract with scrub or jungle.....			
Tamarisk cones: living; dead.....			
Wild poplars (Toghraks): living; dead.....			
Tamarisks: living; dead. Conifers.....			

Mapping Central Asia was a systematic task that was backed by tools, methods, concepts and language accessible to all.

The map captions clearly stated what were the surveyors' first priority: portraying the environmental history of the entire region.





During three successive campaigns, Aurel Stein's party of surveyors repeatedly crisscrossed the Lop desert to achieve better accuracy and consistency.

MAPS OF CHINESE TURKESTAN AND KANSU
 FROM SURVEYS MADE DURING THE EXPLORATIONS OF SIR AUREL STEIN, K.C.I.E. 1900-01, 1906-08, 1913-15
 INDEX MAP, scale 3,000,000. MAPS, Nos. 1-47, scale 1:500,000 or 1/14 inches to 8 miles

Sheet No. 1 Turug-art, Terek-Dawān 2 Kāshgar, Muztagh-ata 3 Sarikol 4 Yai-dobe 5 Yangi-hissār, Yārkand 6 Karghalik, Kilān 7 Ak-su, Uch-turūn, Kelpin 8 Maral-bāshī 9 Khotan, Sanju 10 Kara-koram, Khitai-Dawān 11 Muz-art 12 Kara-yulghun, Bai	No. 13 Mazār-tāgh, Kara-dong 14 Sampula, Chira, Keriya 15 Yurung-kāsh and Keriya R. Sources 16 Kere-bāzār (Bai) 17 Kuchā 18 Keriya River End 19 Niya 20 Kara-Dawān, Kara-shahr R. 21 Bugur, Korla 22 Charchan 23 Kapa, Achehan	No. 24 Kara-shahr 25 Konche-daryā 26 Vāsh-shahrī 27 Khādālik 28 Turfan 29 Singer, Lou-lan 30 Lop-nör 31 Pichan, Chik-tam 32 Ancient Lop Lake Bed 33 Lowaza, Bāsh-kurghān 34 Barkul, Hāmi 35 Su-lo-ho Delta	No. 36 Khanambal (Anambar) 37 Karlik-tāgh 38 Tun-huang, An-hsi 39 Nan-hu 40 Yü-mēn-hsien 41 Ch'ang-ma 42 Chin-t'a 43 Su-chou 44 Etsin-gol Delta 45 Etsin-gol 46 Kan-chou 47 Kungurche
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A Map of Chilas, Darēl, and Tangir, 1 inch to 12 miles. **B** Map of the Lop Desert, 1 inch to 5 miles.
C Map of Portions of Sistan, scale 1:1,000,000. **D** Map of Dry Helmand Delta, Sistan, 1 inch to 4 miles.

For corrections to be applied to the positions of triangulated points, as shown in maps 2, 3, 9, 14, 15, 21, 23, 25, 26, 27, 29, 30, see the lists of latitudes, longitudes, &c., in Appendix A to Sir A. Stein's 'Memoir on maps of Chinese Turkistan and Kansu'.

THE PULSE OF ASIA

A JOURNEY IN CENTRAL ASIA ILLUSTRATING
THE GEOGRAPHIC BASIS OF HISTORY

BY

ELLSWORTH HUNTINGTON

ILLUSTRATED



Deposition från
K. N. GL. VITTERHETS HISTORIE
OGH ANTIKVITETS AKADEMIEN

BOSTON AND NEW YORK
HOUGHTON MIFFLIN COMPANY

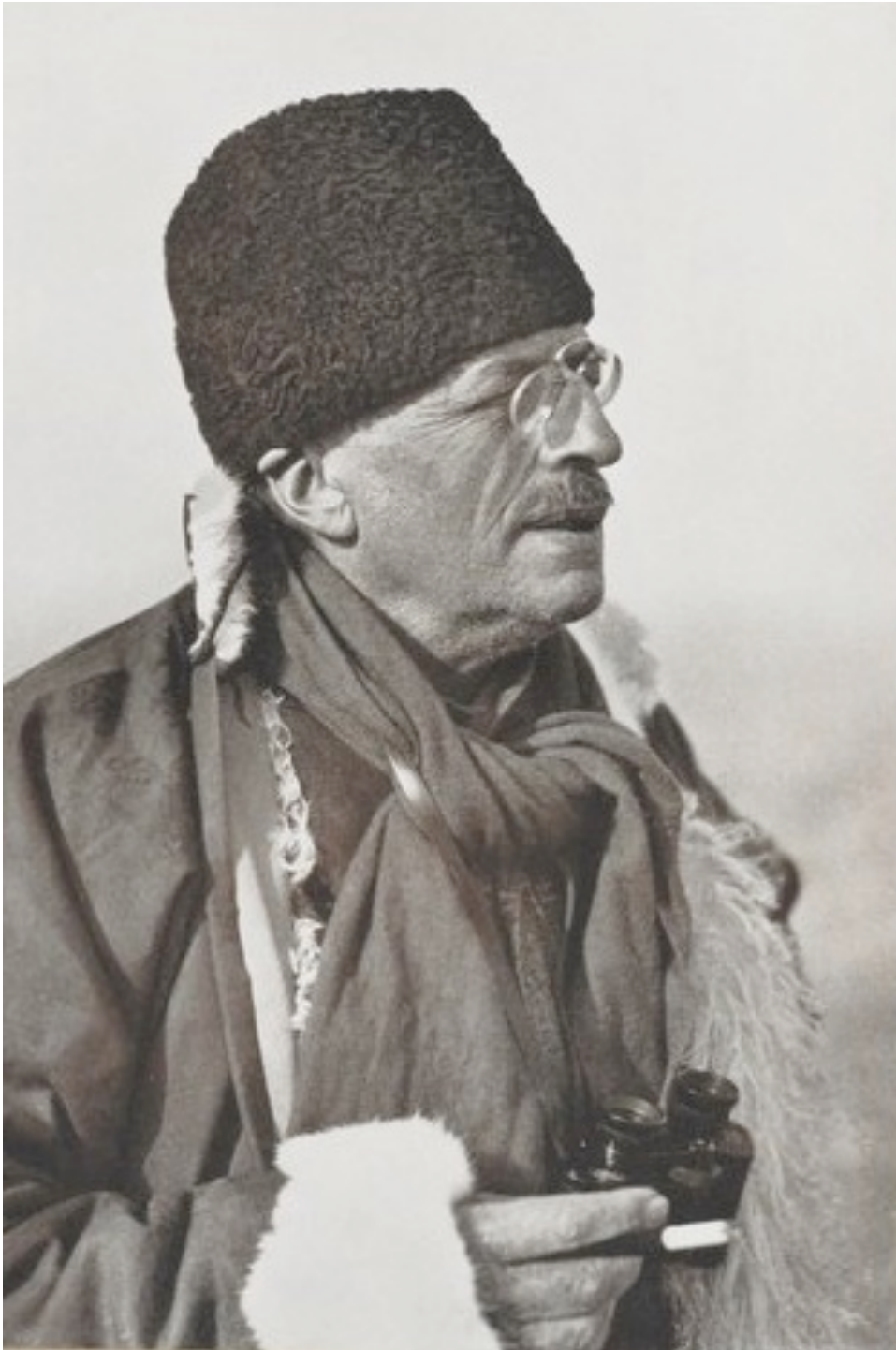
The Pulse of Asia's ambitious and immature claims irritated many geographers. They disapproved of Ellsworth Huntington's grand theory without being able to prove him wrong.

In 1911, the RGS asked in a private letter Sven Hedin what he thought of Huntington's views on climate crises. "Not worth your time" was the short answer.

Picture of the dry bed of Lake Lop Nor
Ellsworth Huntington, *Pulse of Asia*, photograph facing the book's front page



THE SALT PLAIN OF LOP



In 1906-1908, Sven Hedin surveyed along the Tibetan plateau and the Trans-Himalayan mountain range. He was the leader of the large Sino-Swedish Expedition (SSE), 1927-1935.

According to Sven Hedin, climate change would be a slow, linear and progressive phenomenon with limited consequences on human societies. The SSE was a last attempt to check in Central Asia the validity of theories climate change.

ÖFVER LAND TILL INDIEN

GENOM PERSIEN, SEISTAN OCH BELUTJISTAN

AF

SVEN HEDIN

MED NÄRA 300 ILLUSTRATIONER

(HVARAF 90 HEL- OCH DUBBELSIDESBILDER)

SAMT 2 KARTOR

FÖRRA DELEN



STOCKHOLM
ALBERT BONNIERS FÖRLAG

OVERLAND TO INDIA

BY

SVEN HEDIN

WITH 308 ILLUSTRATIONS FROM PHOTOGRAPHS, WATER-
COLOUR SKETCHES, AND DRAWINGS BY THE AUTHOR
AND 2 MAPS

IN TWO VOLUMES

VOL. I

MACMILLAN AND
ST. MARTIN'S STREET

1910

Overland to India, 1910

Like Huntington, Hedin was a prolific writer eager to please his popular audience. Although *Overland to India* was not as successful as *Trans-Himalayas* published the same year, Hedin's account of his journey through Iran served several purposes, which were not all clearly stated.

TO

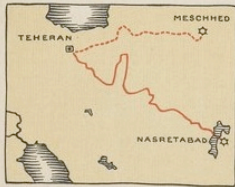
MY FRIEND

LIEUT.-COL. SIR J. R. DUNLOP SMITH

K.C.S.I., C.I.E.

EINE
ROUTENAUFNAHME
DURCH
OSTPERSIEN
VON
SVEN HEDIN

BAND I.



STOCKHOLM
GENERALSTABENS LIT. ANSTALT

Overland to India received later a scientific companion, *Eine Routenaufnahme durch Ostpersien* (two volumes and an atlas)



PROSPECTUS

SOUTHERN TIBET

DISCOVERIES IN FORMER TIMES COMPARED
WITH MY OWN RESEARCHES IN 1906—1908

BY

SVEN HEDIN

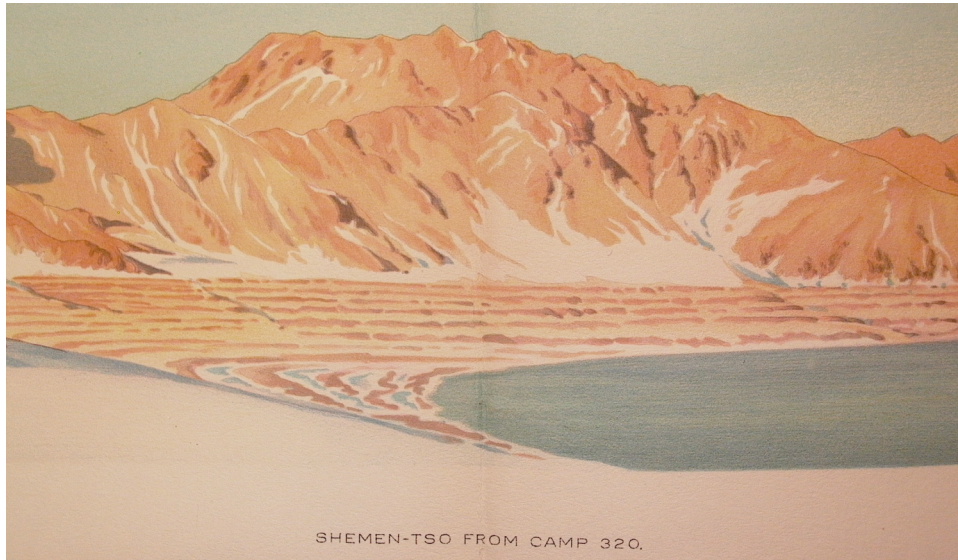
NINE VOLUMES OF TEXT AND
THREE VOLUMES OF MAPS

STOCKHOLM

LITHOGRAPHIC INSTITUTE OF THE GENERAL STAFF OF THE SWEDISH ARMY

Southern Tibet (12 volumes)

Likewise, Hedin compiled and published the scientific companion to *Trans-himalayas, Discoveries and Adventures in Tibet*.



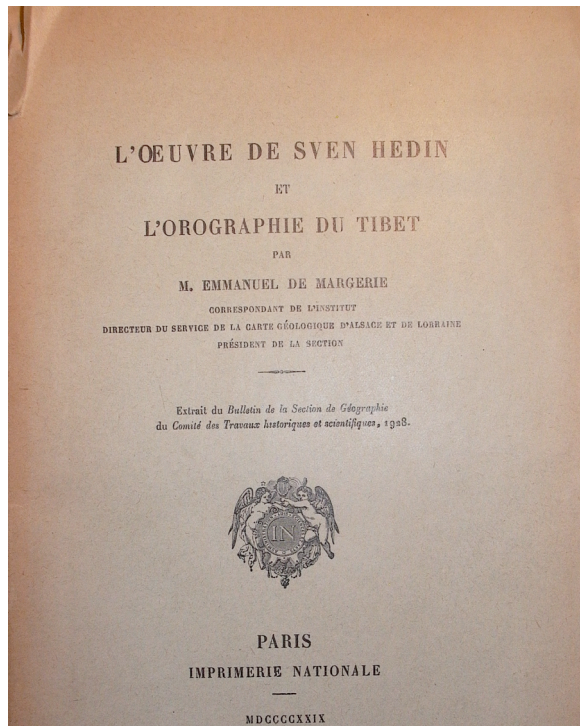
SHEMEN-TSO FROM CAMP 320.

To support the thesis of Central Asia's desiccation, Sven Hedin took measurements of the water levels of Tibetan lakes such as Lake Manasarovar. Accurate mapping would help establish the history of climate fluctuations.



LAKE MANASAROVAR AND MOUNT KALAS AS SEEN FROM TUGU-GOMPA.

Sven Hedin, *Southern Tibet*, Vol. 4



— Vol. II. *My Journey to the Manasarovar and to the Sources of the Satlej and the Indus* (chap. XXII-XXX). — Les sondages de SVEN HEDIN prouvent que le Manasarovar est probablement le lac le plus profond du Tibet; du moins peut-on affirmer qu'il laisse bien loin derrière lui, sous ce rapport, tous les autres lacs que l'explorateur avait sondés au cours de ses précédents voyages: en 1900, il avait trouvé 48 mètres pour un lac d'eau douce situé dans la partie orientale du plateau, et, en 1901, 47 mètres pour le Panggong-tso. Le Manasarovar ne mesure pas moins de 81 mètres, la partie la plus profonde correspondant à la moitié Sud de la cuvette⁽¹⁴⁹⁾. Quant au Rakas-tal, la violence du vent, à l'époque où SVEN HEDIN en parcourait les bords, ne lui a pas permis de le sonder, sauf au voisinage de son extrémité Nord (prof., 28 m.).

À propos des oscillations du niveau de ces deux lacs (chap. XXV), qu'on peut assimiler à des appareils enregistreurs particulièrement sensibles (p. 171), SVEN HEDIN se trouve conduit à aborder le grave

Hedin's research program spelled out:

1. Prove that the duration of the historical period is so short that human settlements have been not affected by climate change.
2. Only periodic variations should be evidenced, and this at the local level.
3. In other words, prove that Huntington is wrong, without saying so explicitly.

L'oeuvre de Sven Hedin et l'orographie du Tibet was the only authoritative and sympathetic review of Hedin's monumental *Southern Tibet*.

REPORTS FROM THE SCIENTIFIC EXPEDITION TO THE NORTH-WESTERN
PROVINCES OF CHINA UNDER THE LEADERSHIP OF DR. SVEN HEDIN
— THE SINO-SWEDISH EXPEDITION —
PUBLICATION 23

HISTORY OF THE
EXPEDITION IN ASIA
1927—1935

BY
SVEN HEDIN

PART I
1927—1928

STOCKHOLM 1943

Sven Hedin's final statement contradicts the findings of his co-workers and his own.

“Life on the endless caravan-routes and in the tents of the camel-men is as picturesque and variegated as it is agreeable and stimulating to the imagination. These born salesmen have lived and worked thus for centuries, and life was just the same in the caravans which marched with bells ringing through the wide spaces of Asia in olden times, maybe long before the dates mentioned in the oldest records preserved.

The conditions were the same then as now; men and camels, country and climate – none has undergone any change worth mentioning.”

History of the Expedition in Asia, Vol. 3, p. 22

Bergman, Hörner, Norin, Chen, Ambolt, Ting, etc. who all worked with Hedin have produced an impressively large literature.

Their reports would support the thesis of climate change occurring in historical times and with disastrous consequences for Central Asia.

Climate scientists have so far ignored their data.



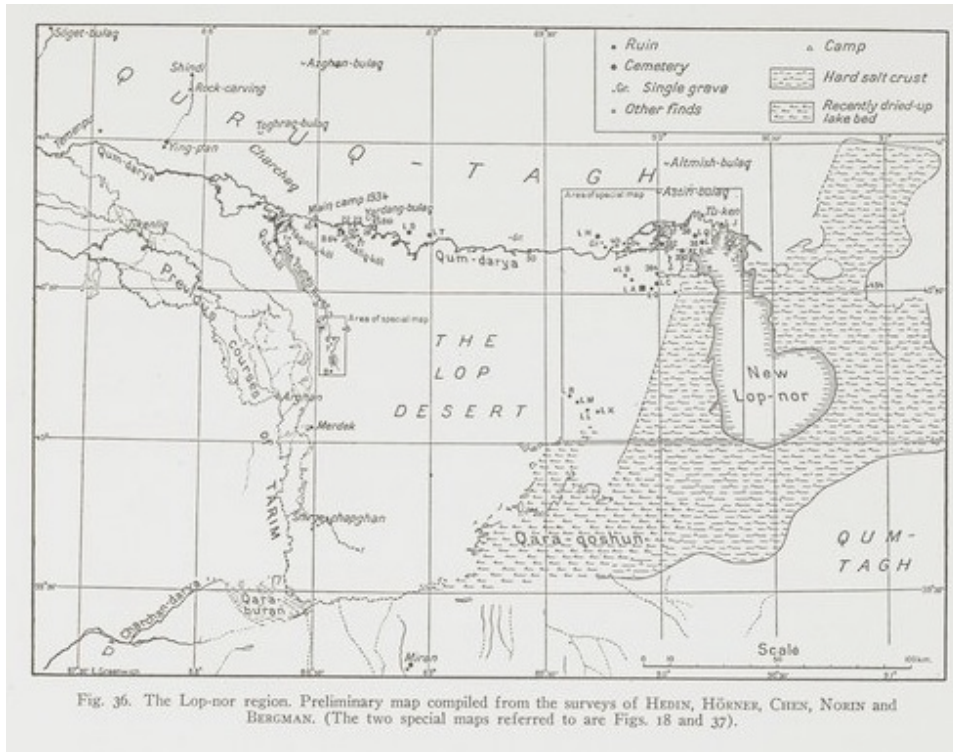
Hedin Photo

Bergman making a plan of the ruined fortress at Ming-shui



The convoy encamped at the Ming-shui ruin in the Fei-shan

Bergman Photo



The verdict of the geography community

“In more than two thousand years of historical times and probably also in those prehistoric ones which extend over the seven thousand years of the post-glacial period, the surroundings of men have undergone no important change in Central Asia.”

Albrecht Penck, *The Geographical Journal*, 76-6 (1930)

Today's mainstream narrative

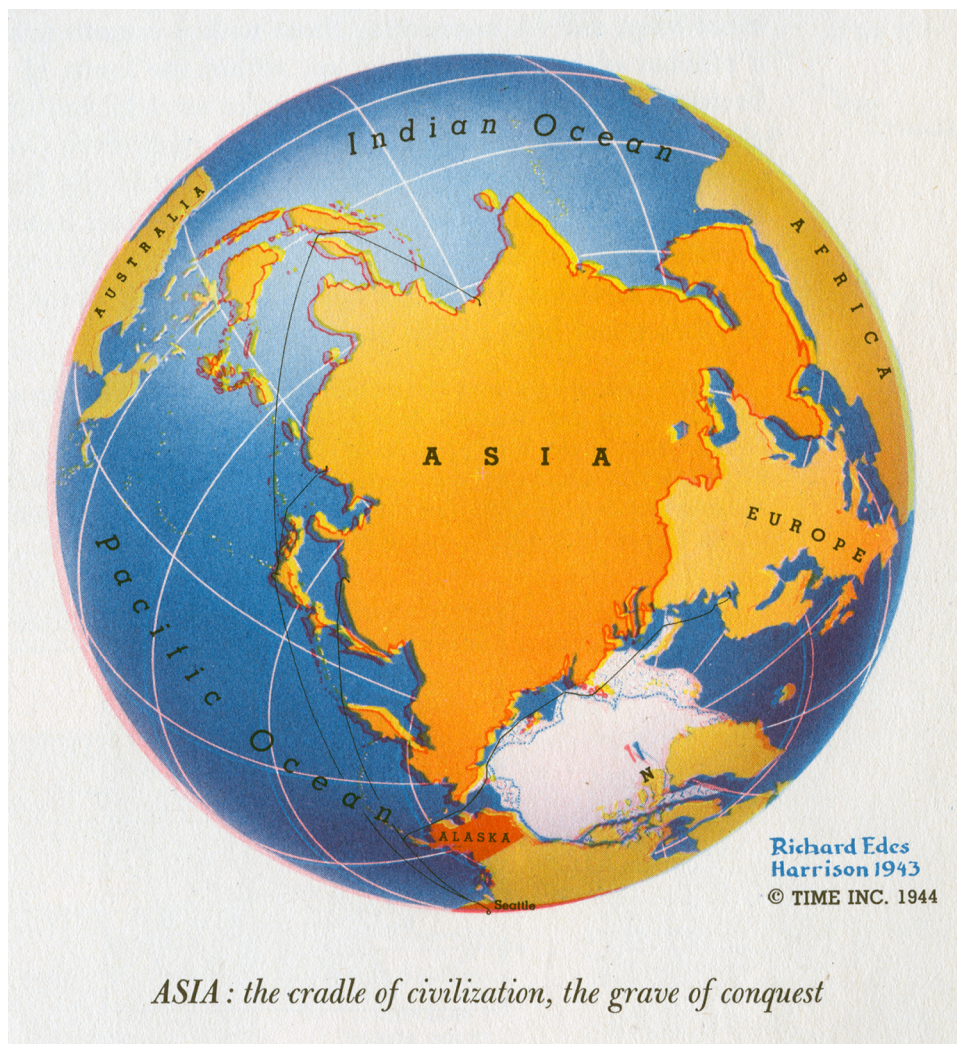


The Discovery of Global Warming, the book, is a compact 200-page summary of what I learned from my research for this Website, woven into a single narrative. It begins as a sort of detective story, describing how a few scientists got obsessed with the mysteries of climate change. By the end it has become an epic tale where entire governments, national publics, and communities of scientists press upon one another. The second edition, extensively revised and updated, is now available (2008).



What do reviewers say about the book? Provides a balanced historical overview of the science of climate change, clearly earning a place as a key work for anyone interested in the topic... The story presented is easy and enjoyable to read... Weart puts a human face on the science without descending into journalistic cliché...

<http://www.aip.org/history/climate/reviews.html>



ASIA: the cradle of civilization, the grave of conquest

Conclusion

Central Asia lies at the periphery of academia and has remained outside the debate on global warming since the 1930s. Studying the history of the research done on Central Asia's past environment in order to contribute to the debate on global warming would seem ludicrous to many climate scientists.

The climate policy of the subcontinent is determined by the misguided alliance of the local governments, often brutal and corrupt, and powerful corporations, often greedy and callous. But this is a different story.