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UNIVERSITY OF ARIZONA

CENTERING OF MENTAL MAPS OF THE WORLD

Thomas F. Saarinen

September, 1987

Discussion Paper

DEPARTMENT OF GEOGRAPHY
and REGIONAL DEVELOPMENT

Tucson, Arizona 85721

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Thomas F. Saarinen

CENTERING OF MENTAL MAPS OF THE WORLD

World maps reflect images of the world. Since "mapmakers are human" as J. K. Wright (1966) so aptly expressed it, every map is "a reflection partly of objective realities and partly subjective elements." Because of the amount of information condensed on maps they provide a rich resource for studying the geographic knowledge and values of the mapmaker and the mapmaker's society. Analysis of world maps from the most ancient to the present provide us with evidence of the comingling of objective and subjective elements and with a means of measuring changing images of the world (Henrikson 1979). This paper is placed in the context of cognitive mapping research, then a brief sketch is provided of how world maps of the past have reflected world images. This is followed by an analysis of one aspect of current world images, how mental maps of the world are centered, based on a worldwide sample of student sketch maps of the world. The paper represents the start of a much larger project. Many other aspects of images of the world will be analyzed in succeeding papers.

Cognitive Mapping

For the past several decades cognitive mapping has been a burgeoning interdisciplinary field of research. The earliest use of the term cognitive map is credited to Tolman (1948) but much inspiration for the start of the field can be traced to The Image of the City by Lynch (1960). The first introductory volume which outlined the scope and approaches was Image and Environment by Downs & Stea (1973) later followed by more popular introductions by Downs & Stea (1977) and Gould & White (1974, 2nd edition 1986). Hundreds of articles have appeared and the flavor of the discussion may be sampled by a perusal of the many review articles and the thoughtful assessments from a variety of disciplinary perspectives (Cox & Golledge 1969, Wood 1971, Tuan 1975, Golledge & Rushton 1976, Moore & Golledge 1976, Tobler 1976, Boyle & Robinson 1979, Evans 1980, Cox & Golledge 1981, Downs 1981, Lloyd 1982, Olson 1984, Golledge et al. 1985, Spencer & Blades 1986).

Downs & Stea (1973) define cognitive mapping as "a construct which encompasses those cognitive processes which enable people to acquire, code, store, recall, and manipulate information about the nature of their spatial environment." It has been assumed that this type of information is an important component in the process of spatial decision making. The terms mental maps or cognitive maps may imply that this information is stored in a map-like form but this is not necessarily so. Much recent work in cognitive psychology focuses on this issue and presents arguments for and against various theories based on systematic distortions of cognitive maps and spatial judgement (Stevens & Coupe 1978, Sadalla et al. 1980, Tversky 1981, Holyoak & Mah 1982, Lloyd 1982, Thorndyke & Hayes-Roth 1982, Lloyd & Heivly 1985, McNamara 1986).

The early and popular sketch map technique is only one of many ways to tap people's internal spatial representations. Golledge (1975) compiled a detailed list of other approaches. Many cognitive mapping studies, focusing on the intraurban scale, have attempted to gain greater precision by using numeric methods to compare subjective estimates with objective measures of limited aspects of environments, as in research on cognitive distance (Cadwallader 1979). Similar methods have recently been applied effectively in the investigation of mental maps at a global level (Muller 1985).

The sketch map method of eliciting cognitive maps produces fascinating products and is notable for the flexibility, openness and potentially deep psychological insights which such projective techniques make possible (Saarinen 1973b). But the technique has also been much criticized because the interpretation of the products may pose problems, and without training in map sketching people are not able to locate on maps at the intraurban scale all the places they know (Wood 1973, Wood & Beck 1976). Other criticisms have been that sketch maps test drawing skills rather than knowledge; that they are not uniform in scale, orientation, and content which prohibits meaningful measurement of relative distance and direction; that they cannot be compared directly with the environment, and that different researchers score them in different ways so that separate studies from different places are incomparable.

A recent study by Buttenfield (1986) compared distortion on cognitive maps produced by sketch mapping with some constraints and, by estimated distances using multidimensional scaling. She raises the question of a trade-off between constraint and quality of cognitive representation at the intraurban scale. Each constraint imposes changes in the product. The most appropriate method varies with the purpose of the research. In this study of world images the sketch map technique is used because richness of substantive content and a holistic perspective are more important to its objectives than precise measurement of specific geometric properties. Furthermore the formidable problems of translating questions, concepts, and instructions for cross-cultural research are simplified by use of the sketch mapping technique (Saarinen 1974), which from its inception has been applied successfully in widely differing countries (DeJonge 1962, Appleyard 1969, Wood 1971), and recognized as useful in highlighting cultural (Gulick 1963) and ethnic differences (Orleans 1973). Aspects of the study design which mitigate criticisms of the sketch mapping method are noted below in the discussion of the sample and the instructions.

World scale cognitive maps differ significantly from those of smaller areas. Images of the world are derived from education rather than from personal experience moving through the environment. The global map models used in formal education are thus particularly important. To investigate images of the world it is necessary to understand the map models on which they are based. For this reason a review of the changing images of the world as revealed in the history of global maps follows.

World Maps and Images of the World

The earliest extant world map is a Babylonian clay tablet from the 6th Century B.C. on which Earth is depicted as a flat circular disc surrounded by ocean and several mythical islands (Wilford 1981). The world is little more than the kingdom of Babylon with the Assyrians to the east, the Chaldeans to the southwest, and the Armenians to the north. The Greeks, who developed the concept of the world as a globe, described a much broader ecumene including the Mediterranean Basin and West Asia (Bunbury 1959). The Greek period of scientific cartography culminated in the map of Ptolemy which remained the most accurate and authoritative world map until the European age of discovery. In addition to good information Ptolemy's map contained misconceptions such as a land connection from Africa to Southeast Asia making an enclosed basin from the Indian Ocean. The Greeks also postulated other continents to balance the known world or ecumene which they realized was only a small portion of the globe.

With the discovery of America and the renaissance of scientific cartography the world map was gradually extended and long-held misconceptions such as terra australis incognita, the unknown southern continent, were gradually replaced by more accurate information (Schilder 1976, Skelton 1958, Gilmartin 1984). The Mercator projection, developed in the 16th century as an aid to navigation, was extremely useful during the European age of exploration. In the succeeding centuries it has been very commonly used as a reference base for geographical information quite unrelated to its original advantage of expressing true direction. One example is George R. Parkin's British Empire Map of the World designed to further the cause of imperial unity. This cause was admirably served by the Mercator projection which exaggerates the size of countries closer to the poles such as Canada, a vital link in the empire, and Parkin's homeland (Cook 1984).

In recent decades, as images of the world have changed, the Mercator projection has been increasingly criticized and new projections have been promoted. During World War II, when the world map based on a polar projection captured the imagination of cartographers as a symbol of the new air age, the German and Japanese strategic blunder of not recognizing the geopolitical role of North America was attributed to Axis reliance on the Mercator Projection (Harrison & Weigert 1944, Henrikson 1975). As the Third World was discovered (Sachs 1976) after former Asian and African colonies gained independence post World War II, the Mercator was criticized for promoting a Eurocentric view of the world. The Peters projection has been proposed (The Open University 1983) as admirably designed to redress the balance by drawing attention to the Third World countries.

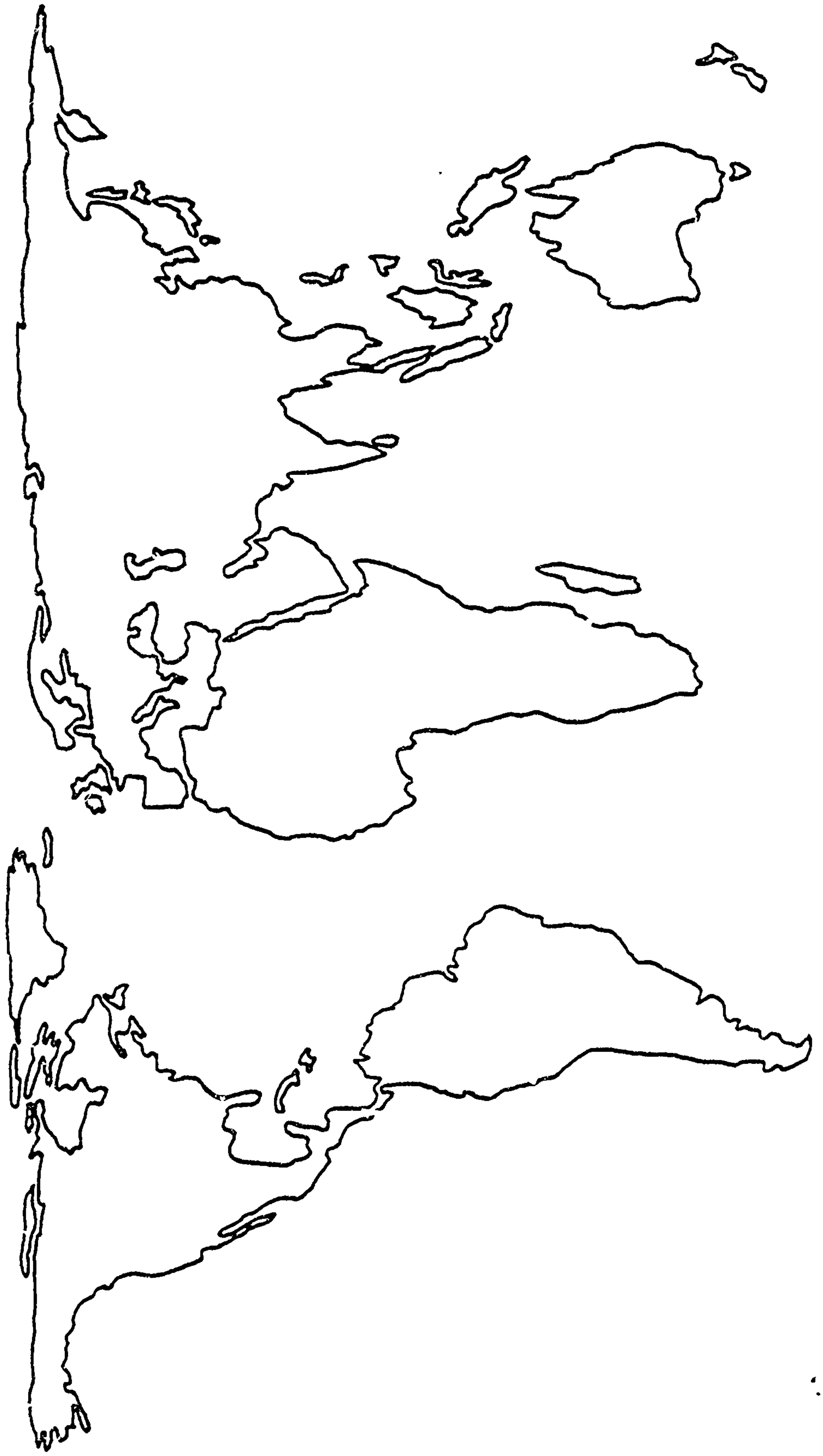
In The New Cartography Arno Peters (1983) traces the history of global maps and global images. The center of the first known global maps was the area in which the mapmakers lived. This custom was continued by the Greeks and Romans. In the Middle Ages Christians placed Jerusalem at the center of their maps while the Arabs made Mecca the focal point. This added an ideological ingredient to map design, according to Peters, for the map center was no longer occupied by one's own home but by the ideological focal point of one's civilization. Peters calls the Mercator map with its Eurocentric world concept the last expression of a subjective global view of primitive peoples. Mercator may not have had any ideological motivation in producing his map. But it appeared near the start of the 400 year period of European colonial rule and as European power spread so did the Eurocentric global concept. A new objective cartography and an egalitarian world map is needed in the postcolonial world to demonstrate the parity of all the earth's peoples. Peters castigates cartographers for not producing one and presents his own Peters Projection as providing such a map and global concept (Map 1).

Arthur H. Robinson (1985) says that Peters is not alone in decrying the use of the Mercator but that there are many other equal area or near equal area projections that display the world with considerably better shapes than either the Mercator or the Peters Projection. He describes the latter as "reminiscent of wet, ragged, long winter underwear hung out to dry on the Arctic Circle".

From the foregoing it is evident that maps of the world have changed in the past and continue to change as new images of the world are developed through increases in knowledge, or changes in perspective. The work discussed has dealt with maps produced by professional cartographers. Only a few studies have examined world maps of ordinary people to learn about public images of the world (Saarinen 1973a, Bosowski 1981, Overjodet 1984).

The Sample

The broader study from which this paper derives was conceived as peace research. An important defense against many dangers in our unstable international system would be reasonably accurate shared image of the world. Unfortunately there is neither a shared image of the world nor documentation of the variety of parochial views of the world held by people from different countries. The study, sponsored by the International Geographical Union and funded by the National Geographical Society, aimed to remedy these deficiencies by providing a systematic set of world images to be obtained by having individuals from a carefully selected sample of countries draw a simple sketch map of the world. When current world images are understood geographic education can be designed to remedy any weaknesses revealed.



MAP 1

In this paper only one aspect of current images of the world is explored by means of these sketch maps of the world. The paper is based on 3,863 sketch maps collected from 71 sites in 49 countries. It analyzes how the maps were centered and what this indicates about images of the world. This paper is only the beginning of the larger project.

During 1986 university geography departments on all continents (except Antarctica) were visited and students in first year geography courses were asked to sketch a map of the world. This population was selected to represent people who have completed the basic educational process and are interested enough in geography to be enrolled in a geography course. It was assumed that their general level of competence in map-drawing would enable them to produce detailed sketch maps of the world representative of the general level of geographic knowledge of the educated population of the country. A major advantage of the sketch map method is that, once the short and simple instructions are translated, it is easy to administer, and it provides directly comparable products from countries of widely differing languages and cultures. Further standardization of procedure to enhance comparability of results was accomplished by having the exercise administered directly by the principal investigator or his research assistant.

The Instructions

The instructions are simple and easily translated. The exact wording of the instructions was:

> "Draw a sketch map of the world on this sheet of paper (8-1/2 X 11 inches or the closest local equivalent). Label all the countries and any other features you think are of interest or importance. Do not worry if your map is not perfect. Just do the best you can. I am sure you will find this an interesting exercise once you get started. Take about 20-30 minutes to complete the task."

The typical response was a laugh or groan or gasp followed by total absorption in the task. For the group sampled, drawing a sketch map of the world is an interesting challenge and only a handful of the 2488 collected in person turned in a blank sheet. We eventually extended the sample by having cooperators follow a standardized set of instructions and send us the sketch maps they collected. This accounts for the second category indicated in Table 1 by asterisks.

In drawing a map of the world on a blank sheet of paper, the sketcher is trying to reproduce from memory a world political map since the instructions explicitly asked for the names of all the countries. These instructions should enhance the general tendency observed on previous global sketch maps to use nations as building blocks. The task, though interesting, is difficult. It seems likely that the map sketcher relies on memories of the type of world map that most readily comes to mind. The map which is most readily recalled would likely be the one most commonly seen and used in the map sketcher's society. By examining how the sketch maps were centered in this broad world sample, one can learn something about how the world political map is presented in different parts of the world and gain insights as to how one's society is viewed in relation to the rest of the world. We can also learn whether there are systematic differences in world images based on location, culture, or other factors.

On the back of the maps the sketchers provided basic information on their age, sex, education, world travel and languages spoken. Further information was obtained from the cooperators on geographic education within the country. In addition a smaller sample of map sketchers were interviewed after the excercise and asked a series of questions about their map such as where they began, the sequence of continents sketched, which portions were easiest and most difficult to draw and why, as well as specific questions related to why areas were left blank or done in great detail.

The Results

Preliminary examination indicated obvious differences in the ways the maps were centered. The three main types of centering to be seen in the sketch maps are described as Eurocentric, Sinocentric, and Americentric. In addition a variety of other maps were not centered in either of these three ways.

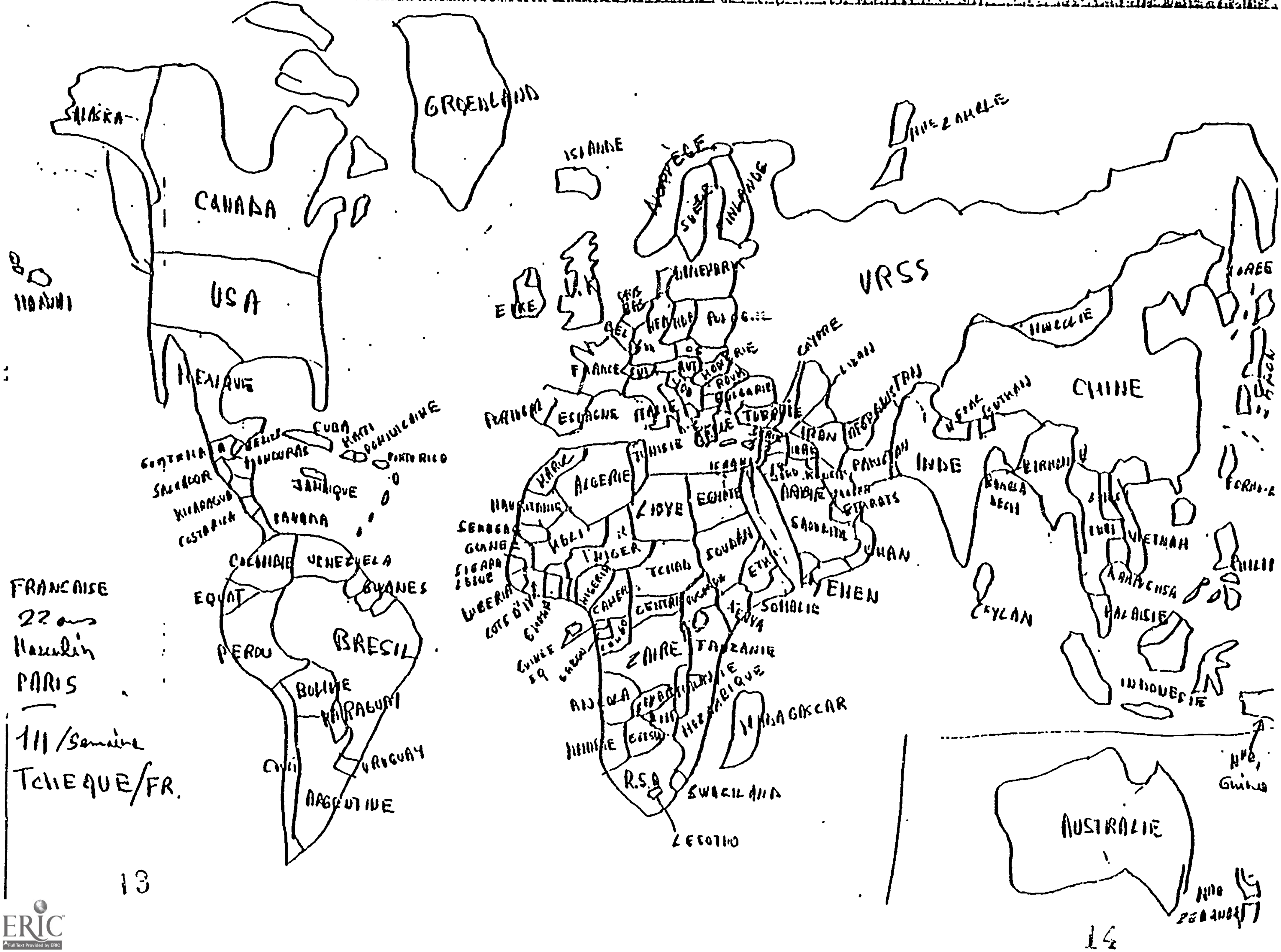
The Eurocentric Maps

The Eurocentric map of the world has probably been the most commonly used flat world map since the location and dimensions of the New World gradually became known after the European Age of Discovery.

For the purposes of this study the Eurocentric category includes all maps with the Americas on the left, then the Atlantic Ocean, Europe and Africa centrally placed, and East Asia on the right. The Pacific Ocean is not featured and appears only on the edges. Map 2 shows a sample sketched by a student from Paris. But it is not simply Europeans who sketch this arrangement of the world's landmasses. It was produced in countries on all continents as is illustrated by Map 3 from Edmonton, Map 4 from Santa Marta, Columbia, Map 5 from Abidjan, Map 6 from Kuwait, and Map 7 from Bangkok. Europe is not necessarily dead center as on Map 8 from Argentina, nor is the continent necessarily depicted accurately in size or shape but all maps classified as Eurocentric shared the configuration of continents with the Americas on the left, Europe and Africa central, and East Asia on the right.

The predominance of this mode of centering, found on 80% of the maps, is not unexpected given that it is the one accepted by convention since the first International Meridian Conference of 1884. At that time it was decided that the prime meridian for the world should be that passing through Greenwich, England.

MAP 2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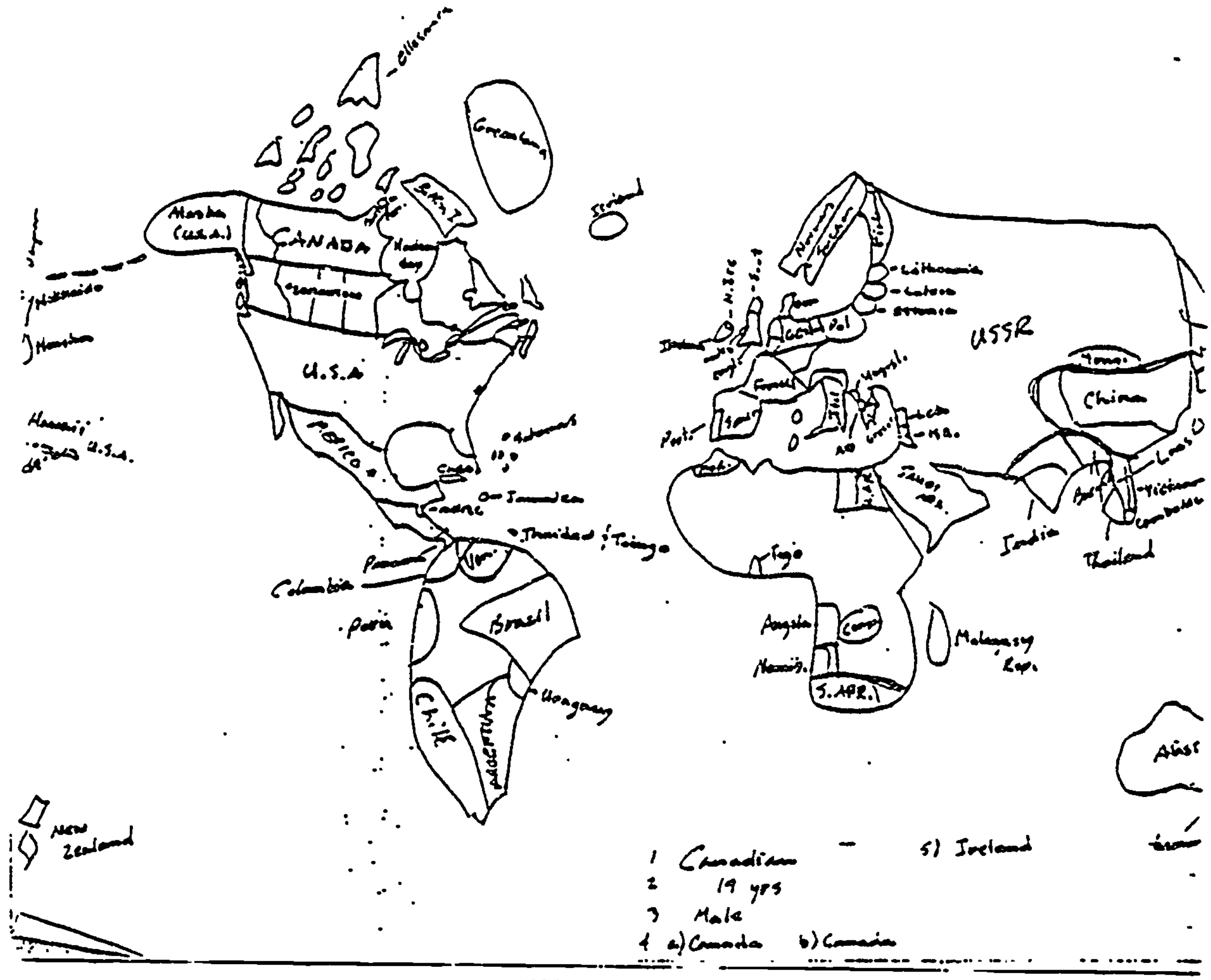
GROENLAND
USA
HAWAII
MEXIQUE
CUBA
HAITI
DOMINICAINE
PORTO RICO
GUATEMALA
BELIZE
HONDURAS
SALVADOR
NICARAGUA
COSTA RICA
JAMAIQUE
PANAMA
COLOMBIE
VENEZUELA
GUYANES
EQUAT
PEROU
BRESIL
BOLIVIE
PARAGUAY
URUGUAY
CHILI
ARGENTINE
ISLANDE
NORVEGE
SUEDE
FINLANDE
DANEMARK
EIRE
U.K
PAYS BAS
BEL
ALLEMAGNE
POLOGNE
TCH
AUT
HONGRIE
ROUM
YOU
BULGARIE
FRANCE
SUI
PORTUGAL
ESPAGNE
ITALIE
GRECE
TURQUIE
CHYPRE
LIBAN
ISRAEL
SYRIE
IRAK
IRAN
JORD.
KOWEIT
ARABIE SAOUDITE
EMIRATS
OMAN
YEMEN
AFGHANISTAN
PAKISTAN
INDE
NEPAL
BHOUTAN
BANGLA DESH
BIRMANIE
CHINE
MONGOLIE
URSS
NOUVELLE ZEMBLE
COREE
JAPON
FORMOSE
THAI
VIETNAM
KAMPUCHEA
MALAISIE
PHILIPPINES
INDONESIE
CEYLAN
Nle Guinee
AUSTRALIE
Nlle ZELANDE
MAROC
ALGERIE
TUNISIE
LIBYE
EGYPTE
MAURITANIE
MALI
NIGER
TCHAD
SOUDAN
ETH
SOMALIE
SENEGAL
GUINEE
SIERRA LEONE
LIBERIA
COTE D'IV
GHANA
NIGERIA
CAMEROUN
CENTRAFRIQUE
OUGANDA
KENYA
CONGO
GABON
GUINEE EQ
ZAIRE
TANZANIE
ANGOLA
ZAMBIE
RHODESIE
MOZAMBIQUE
NAMIBIE
BOTSWANA
R.S.A
SWAZILAND
LESOTHO
MADAGASCAR

FRANCAISE
22 ans
[illegible]
PARIS
1ll /Semaine
TCHEQUE/FR.

MAP 3



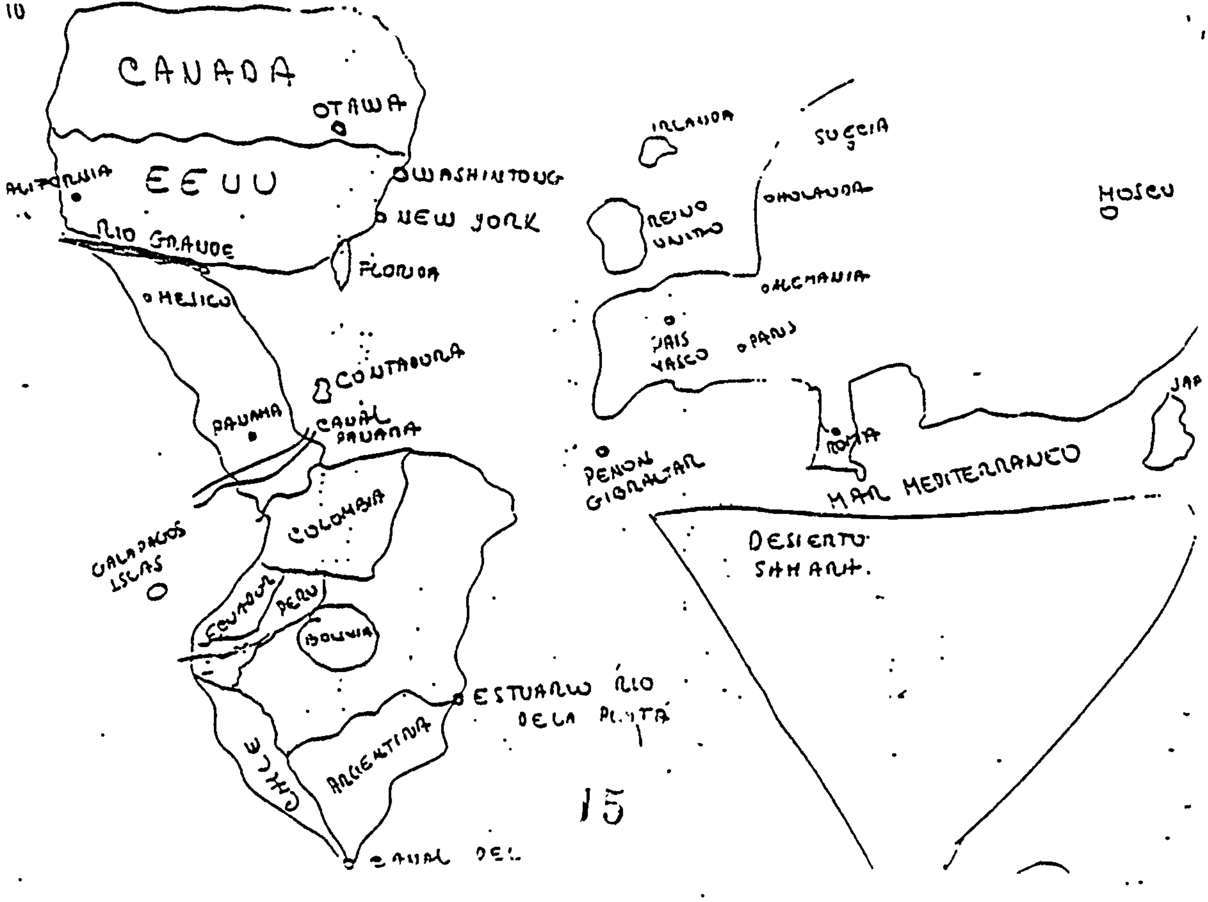
Ellesmere
Greenland
Iceland
Alaska (U.S.A.)
CANADA
Hudson Bay
U.S.A.
Mexico
Cuba
Jamaica
Bahamas
Trinidad & Tobago
Panama
Colombia
Ven.
Brasil
Peru
Chile
Argentina
Uruguay
Japan
Hokkaido
Honshu
Hawaii U.S.A.
New Zealand
Norway
Sweden
Finland
Lithuania
Latvia
Estonia
Ireland
N. Sea
France
Spain
Port.
Italy
Yugosl.
Greece
USSR
China
Laos
Vietnam
Cambodia
India
Thailand
Saudi Arabia
U.A.R.
Togo
Angola
Congo
Namibia
S. Afr.
Malagasy Rep.
Aust.

1 Canadian — 5) Ireland
2 19 yrs
3 Male
4 a) Canada b) Canadian

MAP 4

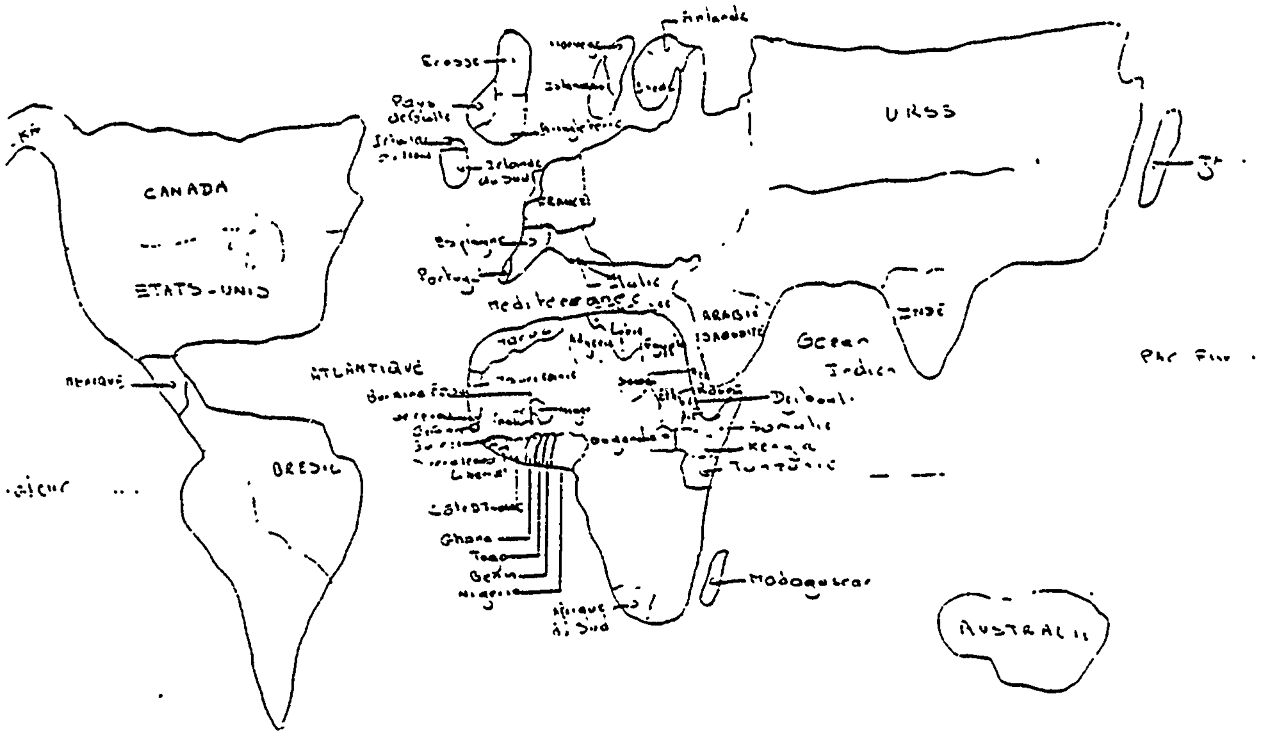
Amerika

10



CANADA
OTAWA
EEUU
CALIFORNIA
WASHINTONG
NEW YORK
RIO GRANDE
FLORIDA
MEJICO
CONTADURA
PANAMA
CANAL PANAMA
COLOMBIA
GALAPAGOS ISLAS
ECUADOR
PERU
BOLIVIA
ESTUARIO RIO DE LA PLATA
CHILE
ARGENTINA
CANAL DEL
IRLANDA
SUECIA
HOLANDA
REINO UNIDO
ALEMANIA
MOSCU
PAIS VASCO
PARIS
JAP
ROMA
PEÑON GIBRALTAR
MAR MEDITERRANEO
DESIERTO SAHARA.

MAP 5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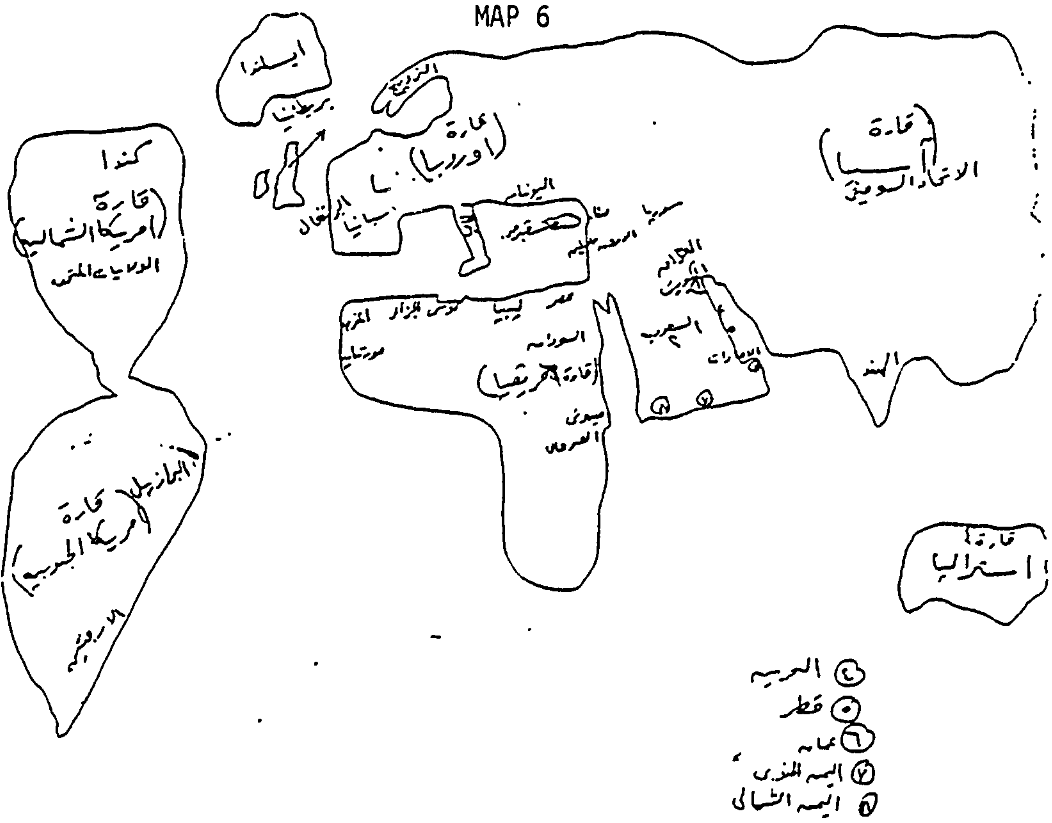
Norvège
Pays de Galles
Suède
Irlande du Nord
Angleterre
Irlande du Sud
URSS
CANADA
ETATS-UNIS
FRANCE
Espagne
Portugal
Italie
Mediterranée
ARABIE SAOUDITE
INDE
Maroc
Algérie
Libie
Egypte
Ocean Indien
ATLANTIQUE
Pac Fic
Mexique
Burkina Faso
Mauritanie
Sénégal
Guinée
Sierra Leone
Liberia
Côte D'Ivoire
Ghana
Togo
Benin
Nigeria
Ouganda
Djibouti
Somalie
Kenya
Tanzanie
BRESIL
Madagascar
Afrique du Sud
AUSTRALIE

MAP 6

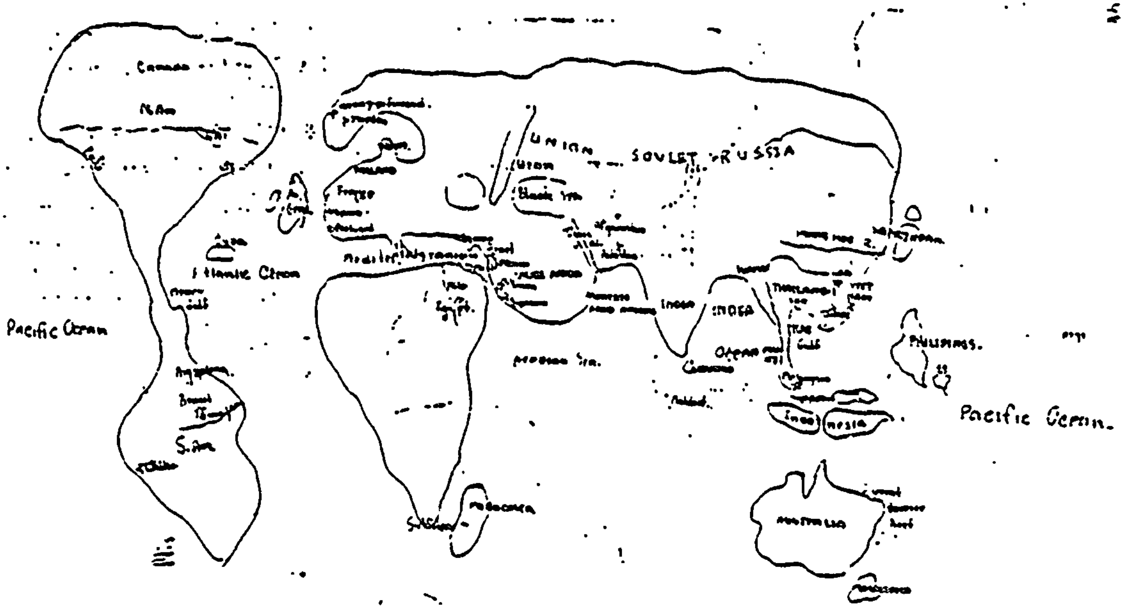
Draw a world map and lable the countries that you know

ارسم خارطة العالم مبينة عليها المواقع من الدول والبلدان التي تعرفها

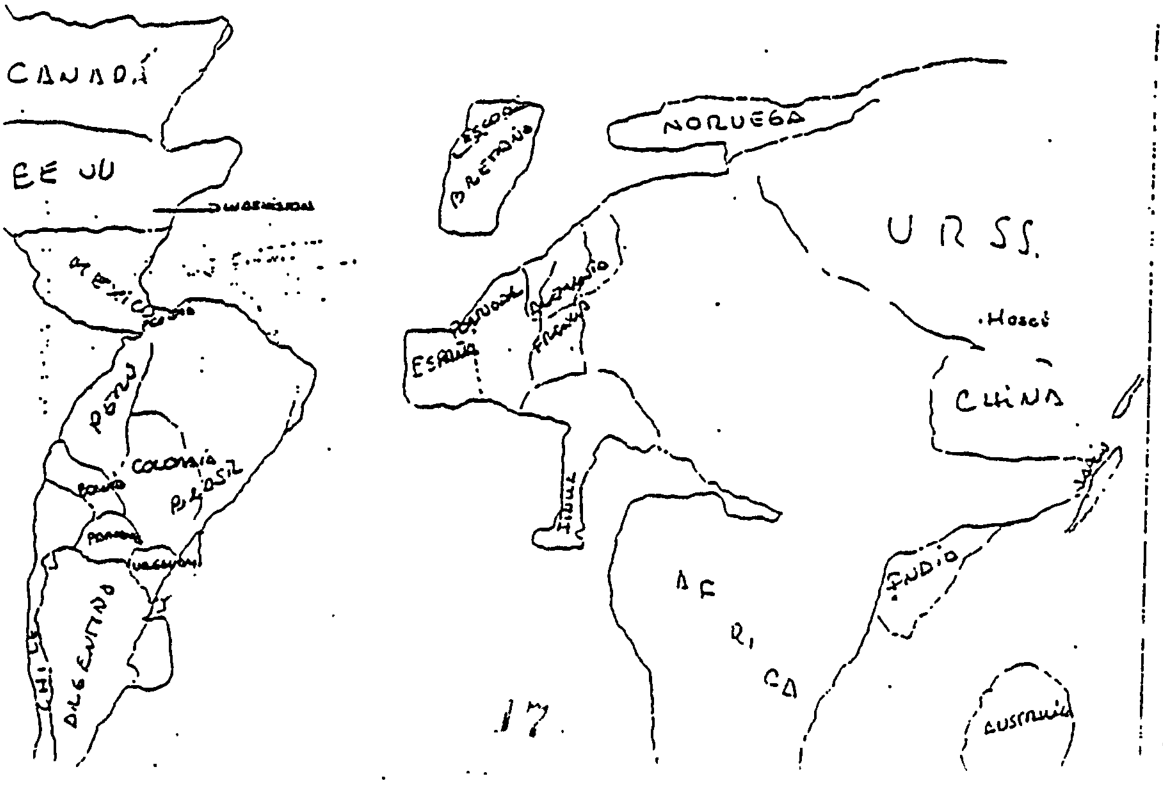

ايسلندا
بريطانيا
النرويج
قارة أوروبا
البرتغال
اسبانيا
اليونان
سوريا
البحر المتوسط
كندا
قارة أمريكا الشمالية
الولايات المتحدة
قارة آسيا
الاتحاد السوفيتي
العراق
الكويت
السعودية
الامارات
الهند
المغرب
الجزائر
تونس
ليبيا
مصر
موريتانيا
السودان
قارة افريقيا
جنوب افريقيا
البرازيل
قارة أمريكا الجنوبية
الارجنتين
قارة استراليا
④ البحرين
⑤ قطر
⑥ عمان
⑦ اليمن الجنوبي
⑧ اليمن الشمالي

16

MAP 7


Canada
N.Am
Atlantic Ocean
Pacific Ocean
S.Am
Union Soviet Russia
India
Philippines
Indonesia
Pacific Ocean
Australia

MAP 8


CANADA
EE UU
WASHINGTON
MEXICO
PERU
COLOMBIA
BRASIL
BOLIVIA
PARAGUAY
URUGUAY
ARGENTINA
CHILE
ESCOCIA
BRETAÑA
NORUEGA
URSS
Moscú
CHINA
ESPAÑA
FRANCIA
AFRICA
INDIA
AUSTRALIA

With this convention the longitudes were labeled east and west of Greenwich and the Eurocentric map provides a conventional world image with west on the left and east on the right and north at the top. Before the Greenwich meridian was agreed upon many prime meridians had been used, including Toledo, Cracow, Uranibourg, Copenhagen, Goes (Ter-Goes), Pisa, Augsburg, Rome, Ulm, Tubingen, Bologna, Rouen, St. Petersburg, Washington and Philadelphia (Brown 1949).

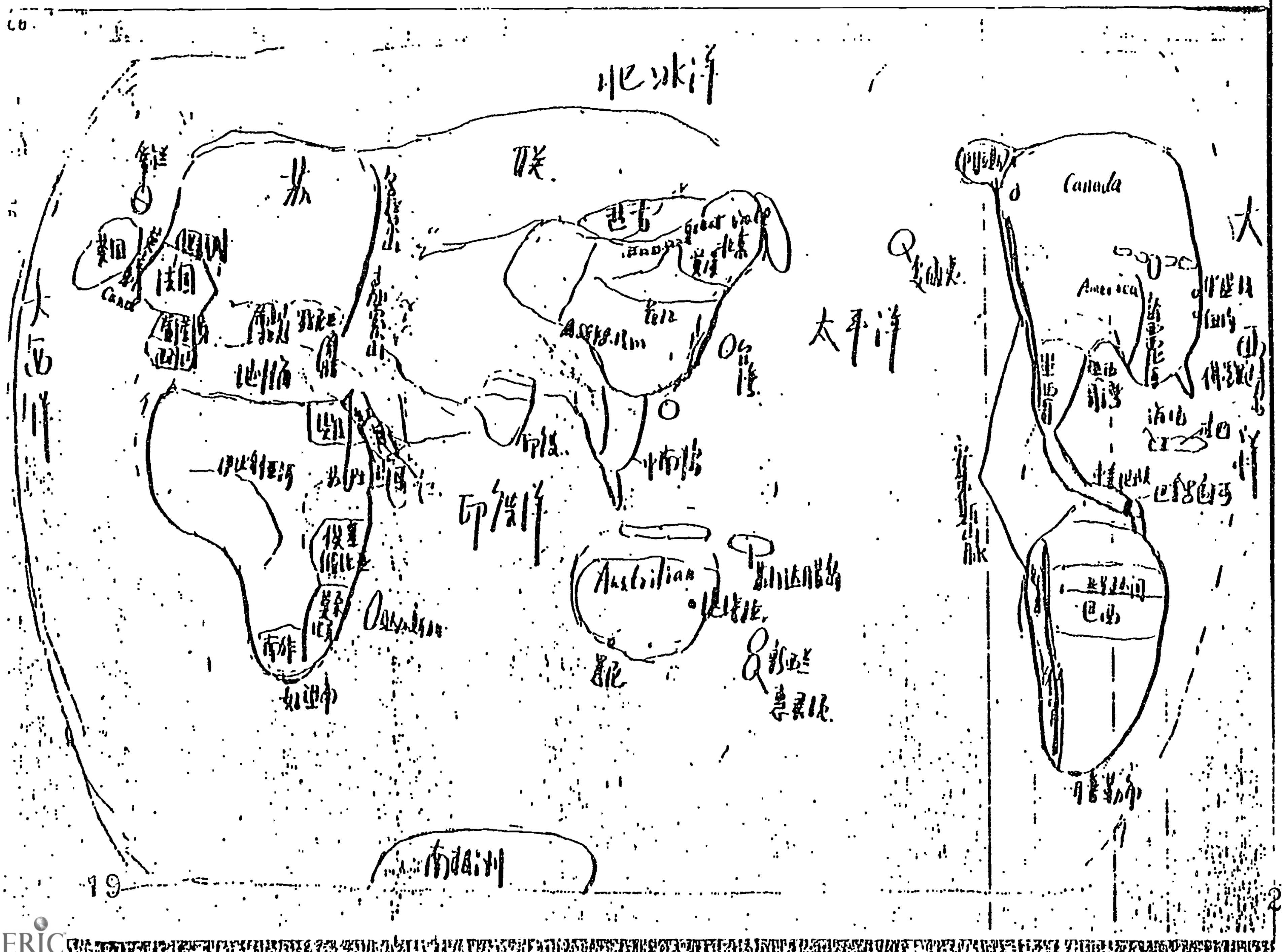
The Eurocentric map is an esthetically pleasing arrangement of the world's landmasses which minimizes the space devoted to oceans. Like the Sinocentric map it represents all continents whole.

Sinocentric Maps

Sinocentric maps of the world are arranged with Europe on the far left, East Asia and the Pacific Ocean central, and the Americas on the right. The Atlantic Ocean only appears on the edges of these maps. This type of world map dates from the time of Matteo Ricci, a Jesuit priest, who arrived in China in 1583. He is credited with bringing Renaissance knowledge of cartography to China (Needham 1959). Many scholarly Chinese were fascinated by the world map he displayed in his mission but did not think it appropriate to place China on the edge of the map rather than in the center where, it seemed to them, it belonged. Ricci responded with his famous world map of 1602 (Boorstin 1983, Baddeley 1917, Giles 1918 and 1919) which centered China. This type of centering was second to the Eurocentric sample accounting for 11% of the maps.

Map 9 sketched by a student from Beijing, Map 10 from Seoul, and Map 11 from Tokyo are typical examples from countries where the Sinocentric map has a long tradition. Map 12 from Jogjakarta and Map 13 from Dunedin are examples from countries which probably started using the Sinocentric map at a later date.

MAP 9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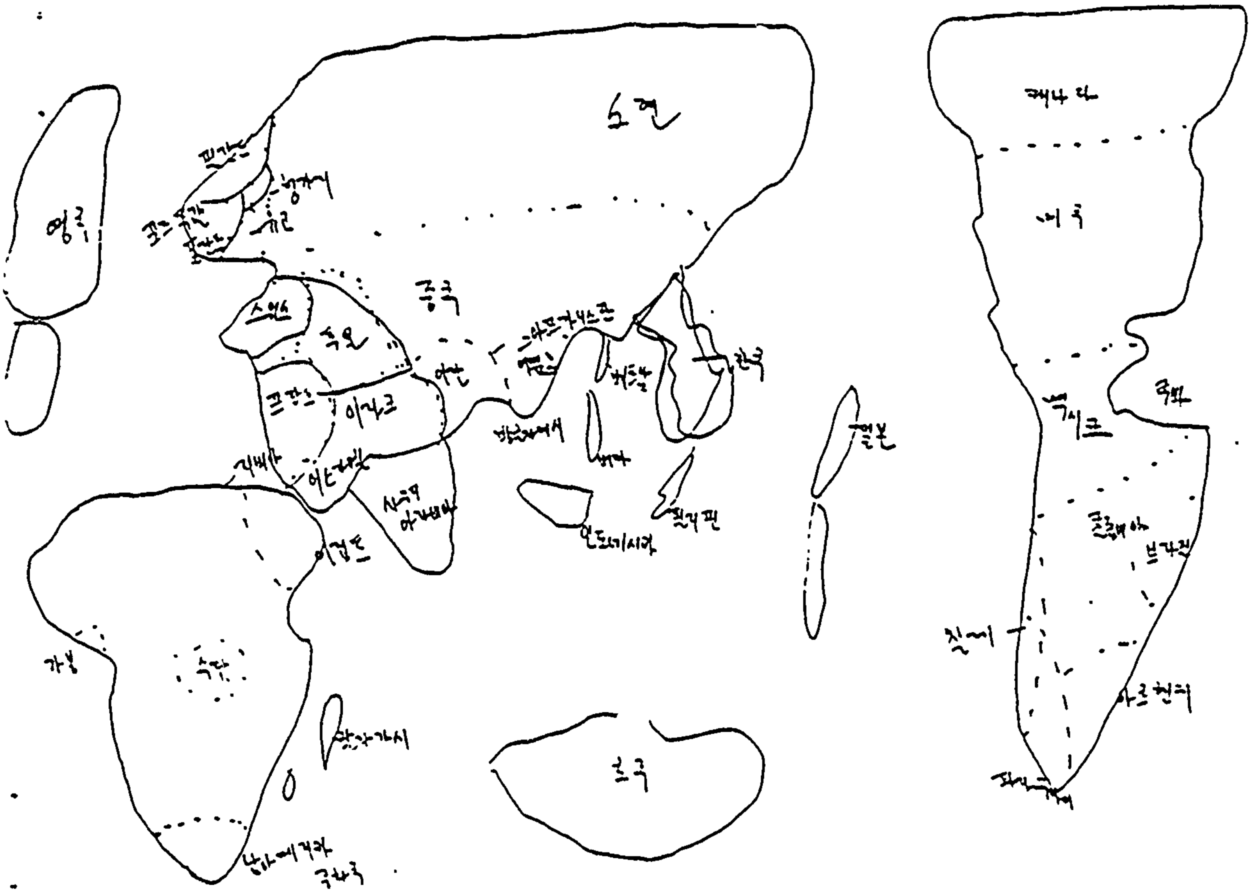
苏
联
蒙古
great wall
北京
太平洋
Canada
America
大西洋
大西洋
地中海
印度洋
Austrlian
南非
巴西
南极洲

MAP 10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핀란드
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스페인
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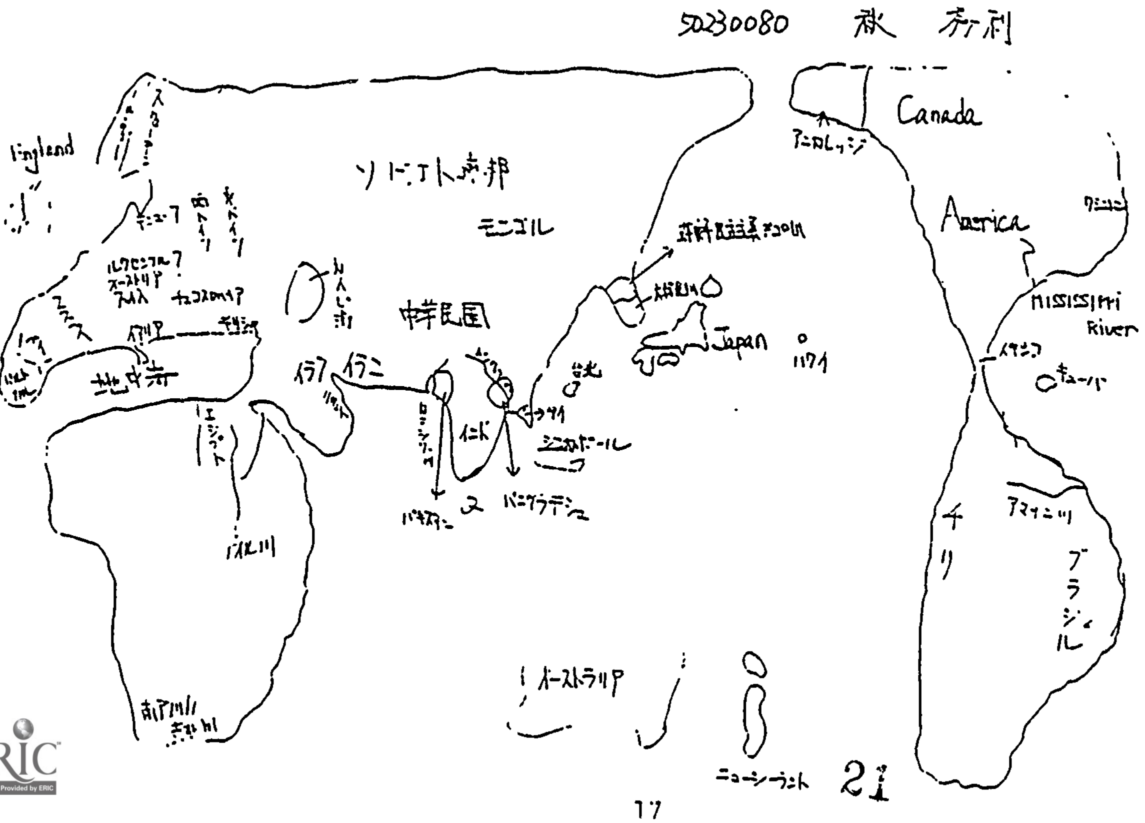
프랑스
이라크
리비아
이란
아프가니스탄
파키스탄
버마
한국
일본
필리핀
인도네시아
사우디 아라비아
이집트
가봉
수단
마다가스카르
남아메리카 공화국
호주
캐나다
미국
멕시코
쿠바
콜롬비아
브라질
칠레
아르헨티나

MAP 11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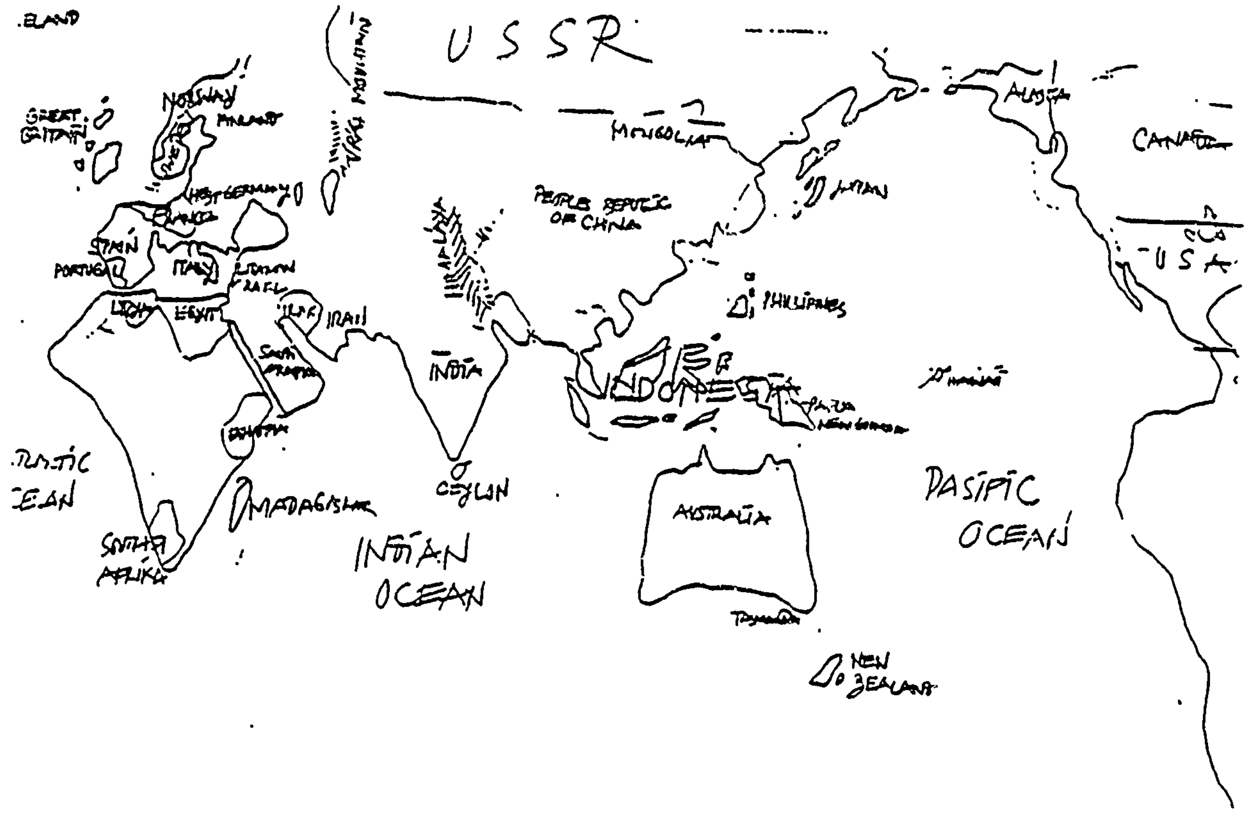
朝鮮民主主義共和国
大韓民国
Japan
ハワイ
Canada
アンカレッジ
America
MISSISSIPPI River
キューバ
アマゾン川
チリ
ブラジル
ドイツ
スイス
フランス
イタリア
地中海
エジプト
ナイル川
南アフリカ共和国
イラク
イラン
インド
パキスタン
バングラデシュ
タイ
シンガポール
台北
オーストラリア
ニュージーランド
21

MAP 12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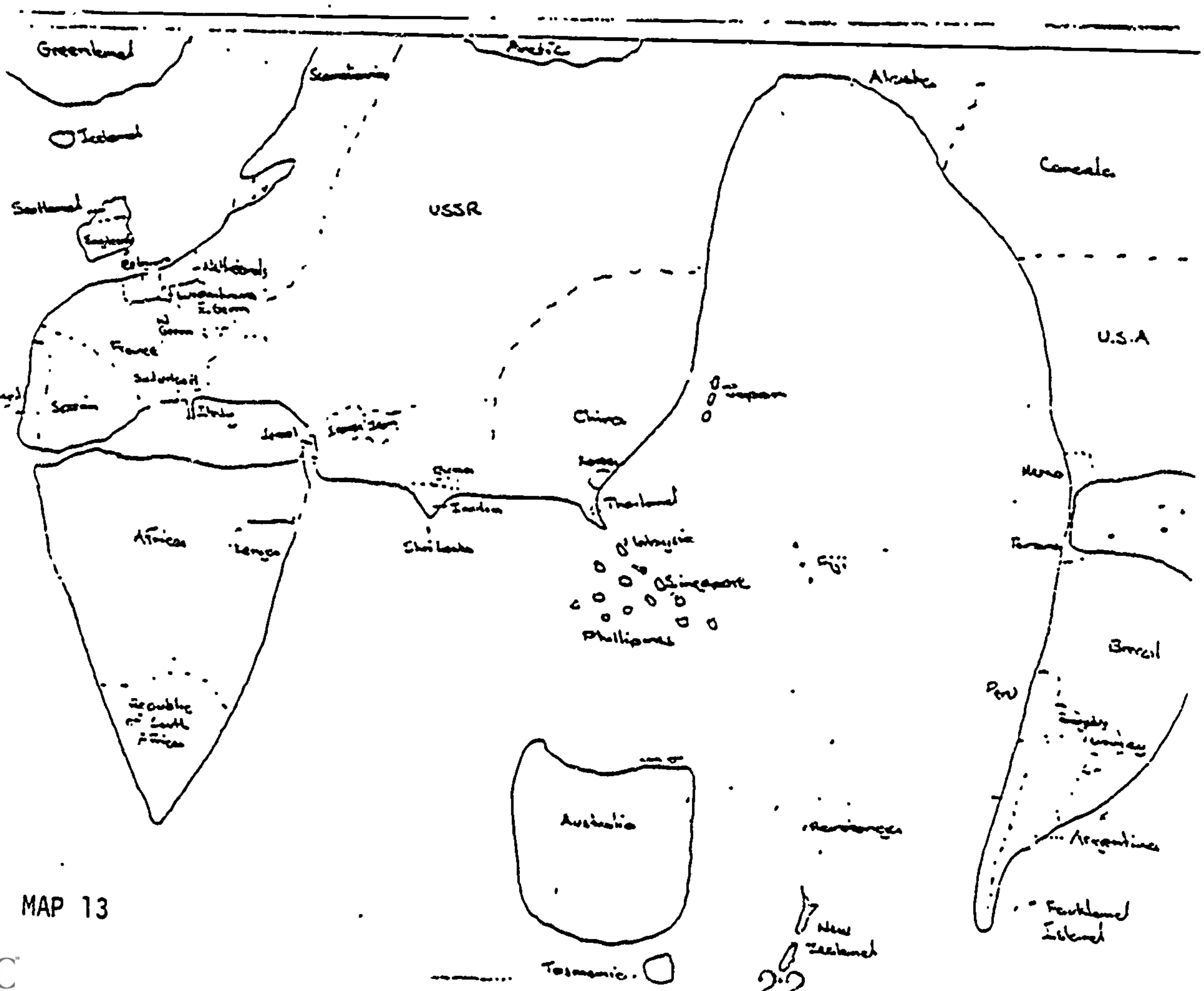
FINLAND
URAL MOUNTAIN
USSR
MONGOLIA
ALASKA
CANADA
WEST GERMANY
FRANCE
SPAIN
PORTUGAL
ITALY
LEBANON
ISRAEL
LIBYA
EGYPT
IRAQ
IRAN
SAUDI ARABIA
PEOPLE REPUBLIC OF CHINA
HIMALAYA
JAPAN
PHILLIPINES
USA
INDIA
INDONESIA
PAPUA NEW GUINEA
HAWAII
ETHIOPIA
ANTIC OCEAN
MADAGISKAR
CEYLON
AUSTRALIA
PASIFIC OCEAN
SOUTH AFRIKA
INDIAN OCEAN
TASMANIA
NEW ZEALAND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Iceland
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Scotland
England
USSR
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W Germany
France
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Spain
Italy
Israel
China
Japan
Korea
Burma
India
Thailand
U.S.A
Mexico
Panama
Africa
Kenya
Sri Lanka
Malaysia
Fiji
Singapore
Philippines
Brazil
Peru
Paraguay
Uruguay
Republic of South Africa
Australia
Argentina
Falkland Island
New Zealand
Tasmania

MAP 13

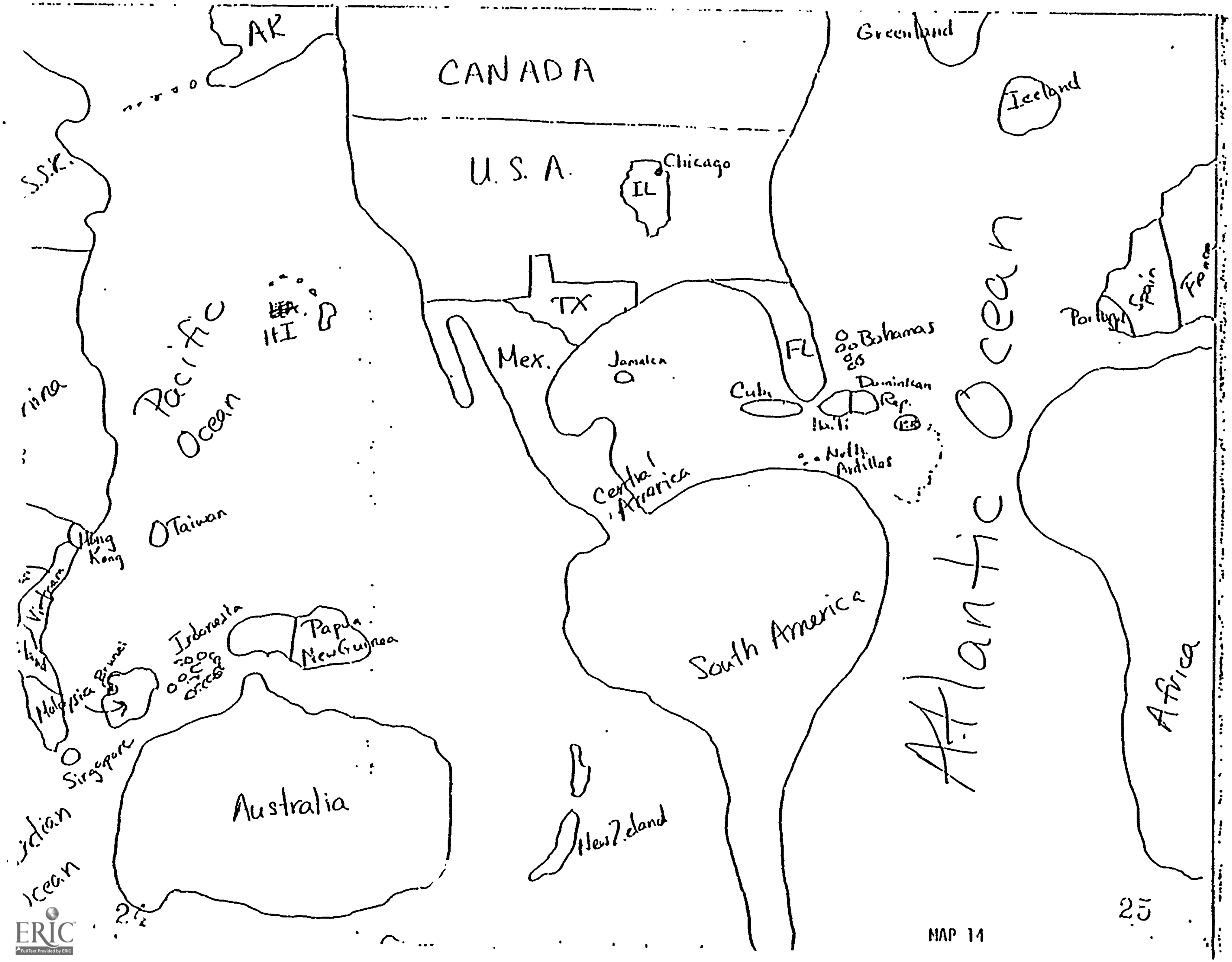
Americentric Maps

The Americentric maps of the world are those that place the Americas in the center. This has the advantage of featuring both the Atlantic and Pacific Oceans but the disadvantage of splitting the Eurasian continent so that the eastern portion of Asia appears on the left side of the map, and Europe and Africa are on the right. According to Alan Henrickson (1980) some of the earliest of the U.S.-centered world maps were published in Boston in 1850 and New York in 1851. The country was seen as deserving a more central position on world maps in the period following such events as the U.S. victory over Mexico and the discovery of gold in California. The continental nature of the young country became more apparent with territory on both the Pacific and Atlantic shores.

Map 14 from Chicago, Map 15 from Taipei, and Map 16 from Caracas are typical. Of the total sample, the Americentric maps comprised 7%.

Other Orientations

The other category contained a variety of maps that could not be classified in the first three categories. Included were any incomplete, confused, or indecipherable maps; two hemisphere maps, or maps with sections drawn on more than one sheet; a few extremely ethnocentric maps centering on the homeland which did not include all continents, such as Map 17 from the Philippines, several maps with the Americas on both left and right edges like Map 18 from Hong Kong; and a small number, mainly from Australia, New Zealand and Taiwan, which like Map 19 from Dunedin place Western Europe on the far right as if it is a destination reached by passing through the Americas. In addition there were two polar projections and one map with two Pacific Oceans. Of the total sample, only 4% were classified as other.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IL
Chicago
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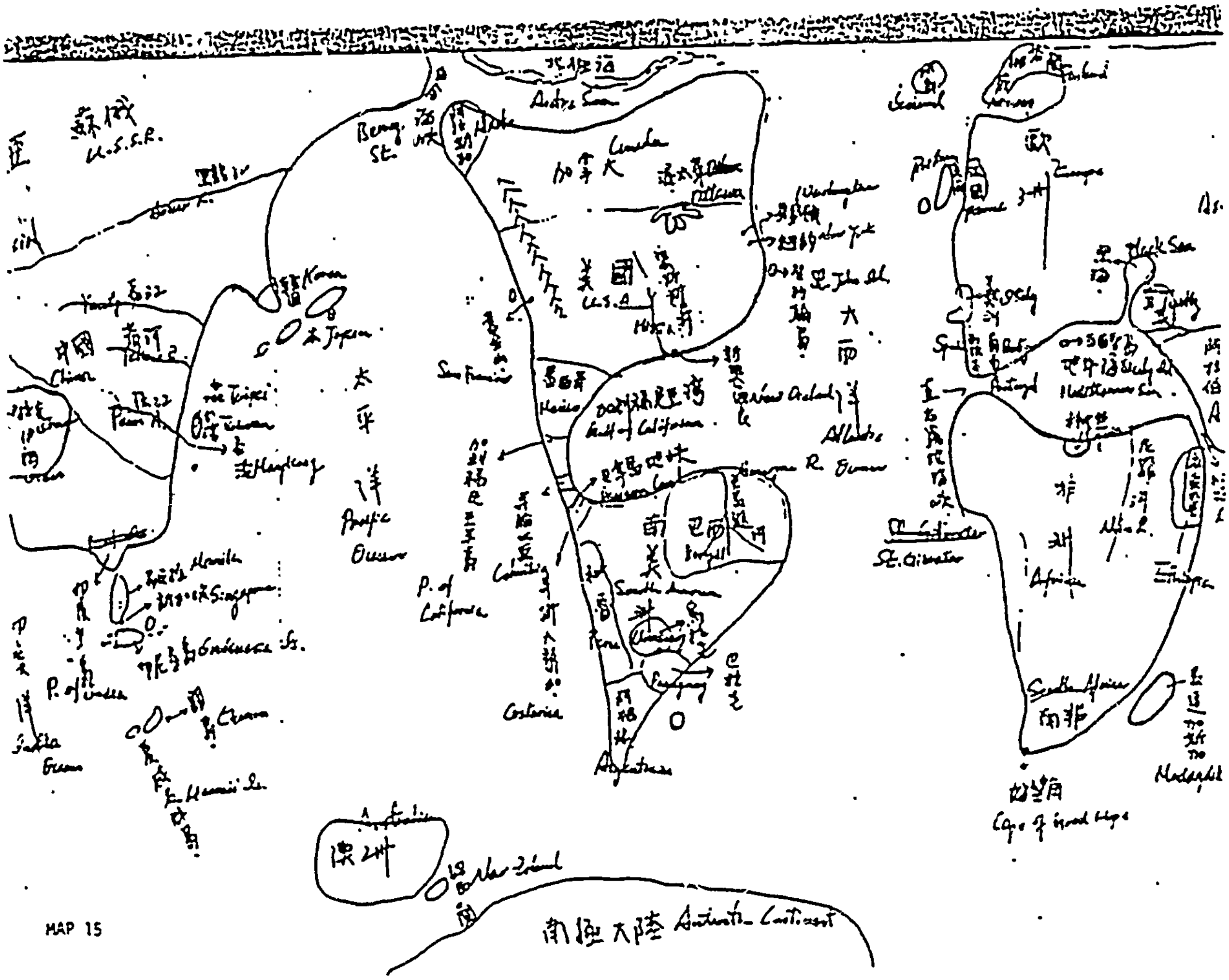
Iceland
S.S.R.
hina
Pacific Ocean
HI
TX
Mex.
Jamaica
FL
Bahamas
Cuba
Dominican Rep.
HaiTi
Neth. Antilles
Central America
South America
Atlantic Ocean
Portugal
Spain
Fra
Africa
Taiwan
Hong Kong
Vietnam
Ind
Malaysia
Brunei
Indonesia
Papua New Guinea
Singapore
Australia
New Zeland
ndian
cean

MAP 14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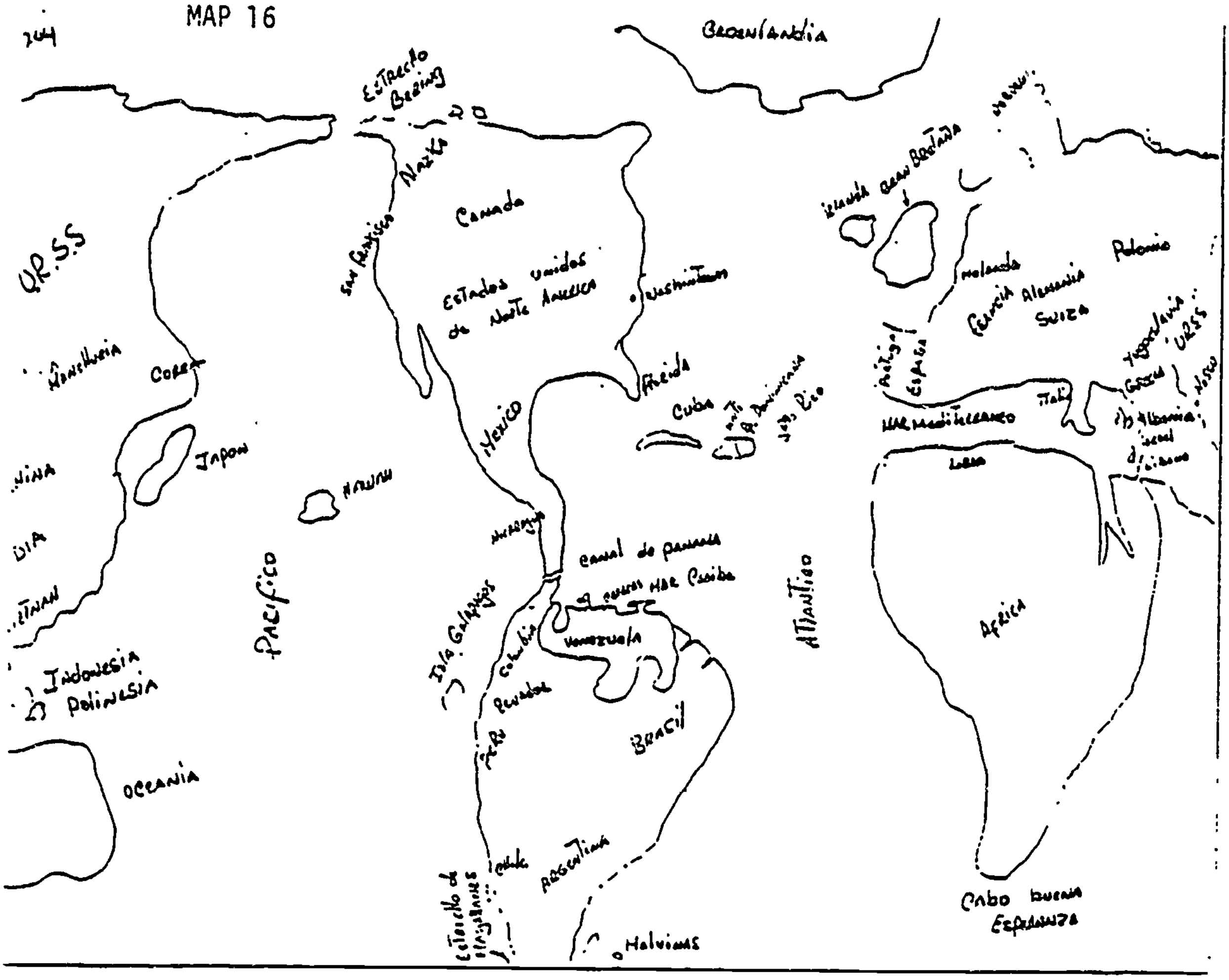
Beng. St.
Arctic Sea
加拿大
Canada
Ottawa
Washington
New York
美国
U.S.A.
San Francisco
Mexico
Gulf of California
Panama Canal
太平洋
Pacific Ocean
大西洋
Atlantic
Korea
日本
Japan
中国
China
Taipei
Taiwan
Hong Kong
Manila
Singapore
P. of India
India Ocean
Guam
Hawaii Is.
Colombia
Peru
Amazon R.
南美洲
South America
巴西
Brazil
Paraguay
Argentina
Iceland
Norway
Finland
欧洲
Europe
Black Sea
Italy
Sicily
Spain
Portugal
Mediterranean Sea
St. Gibraltar
非洲
Africa
Nile R.
Ethiopia
南非
South Africa
Madagascar
好望角
Cape of Good Hope
澳洲
Australia
New Zealand
南极大陆
Antarctic Continent

MAP 15

244

MAP 16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Nazka
Canada
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Estados unidos de Norte America
Washington
U.R.S.S
Manchuria
Corea
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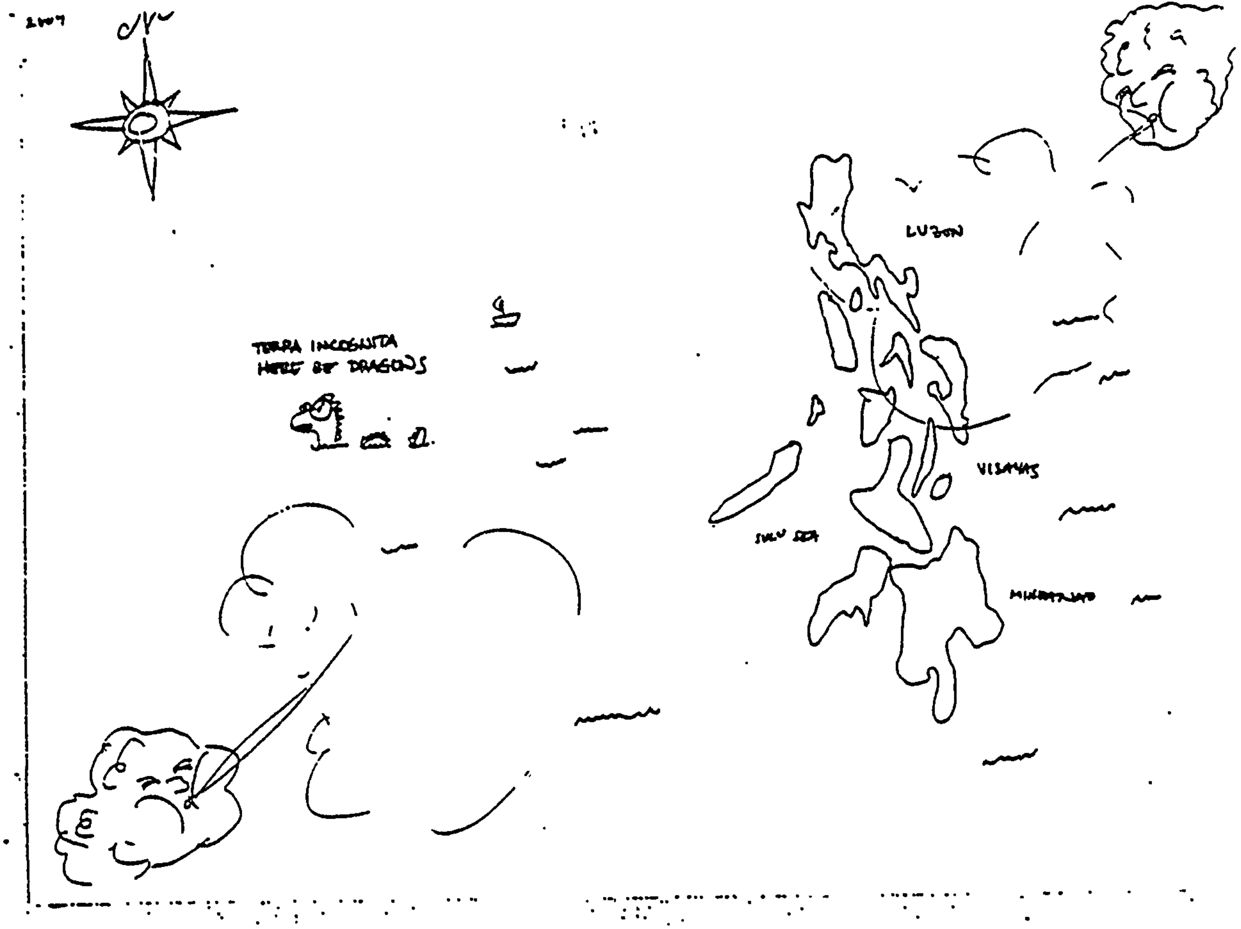
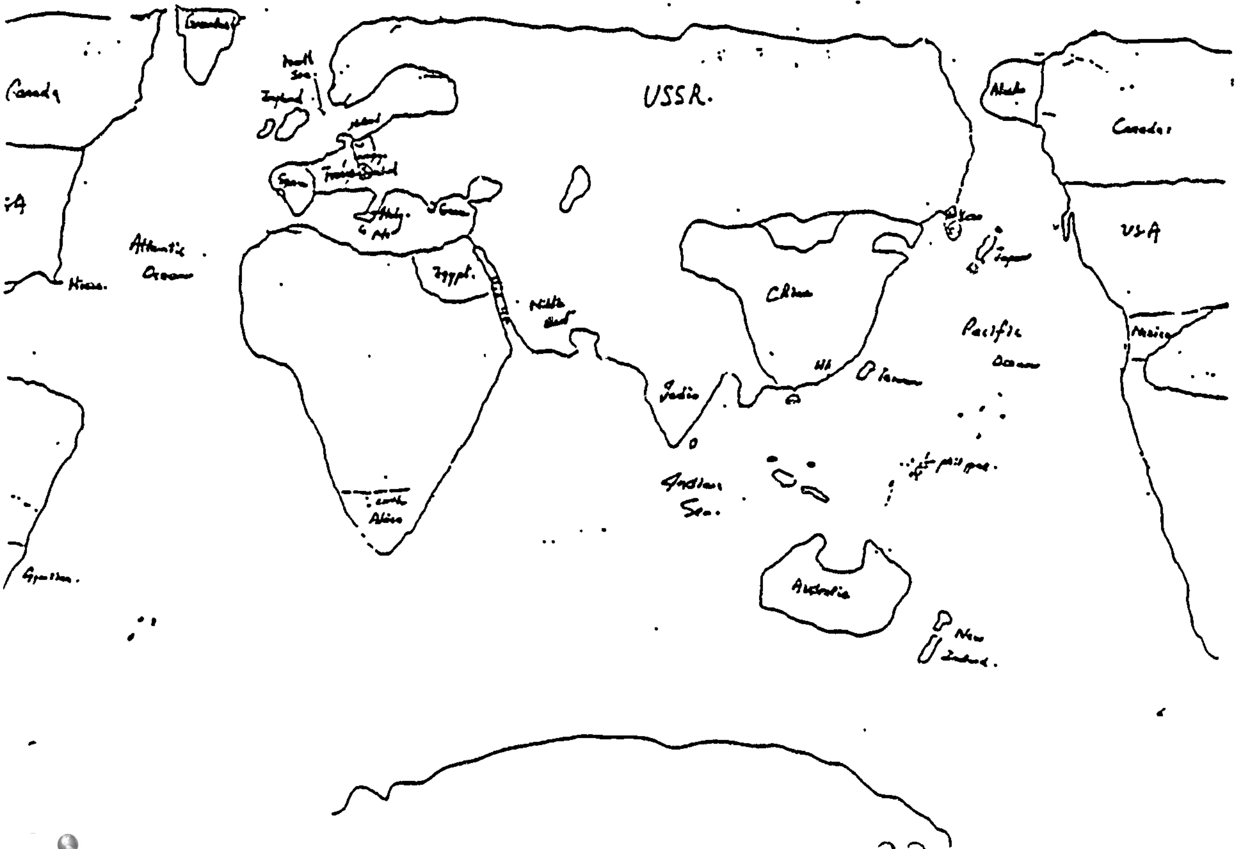
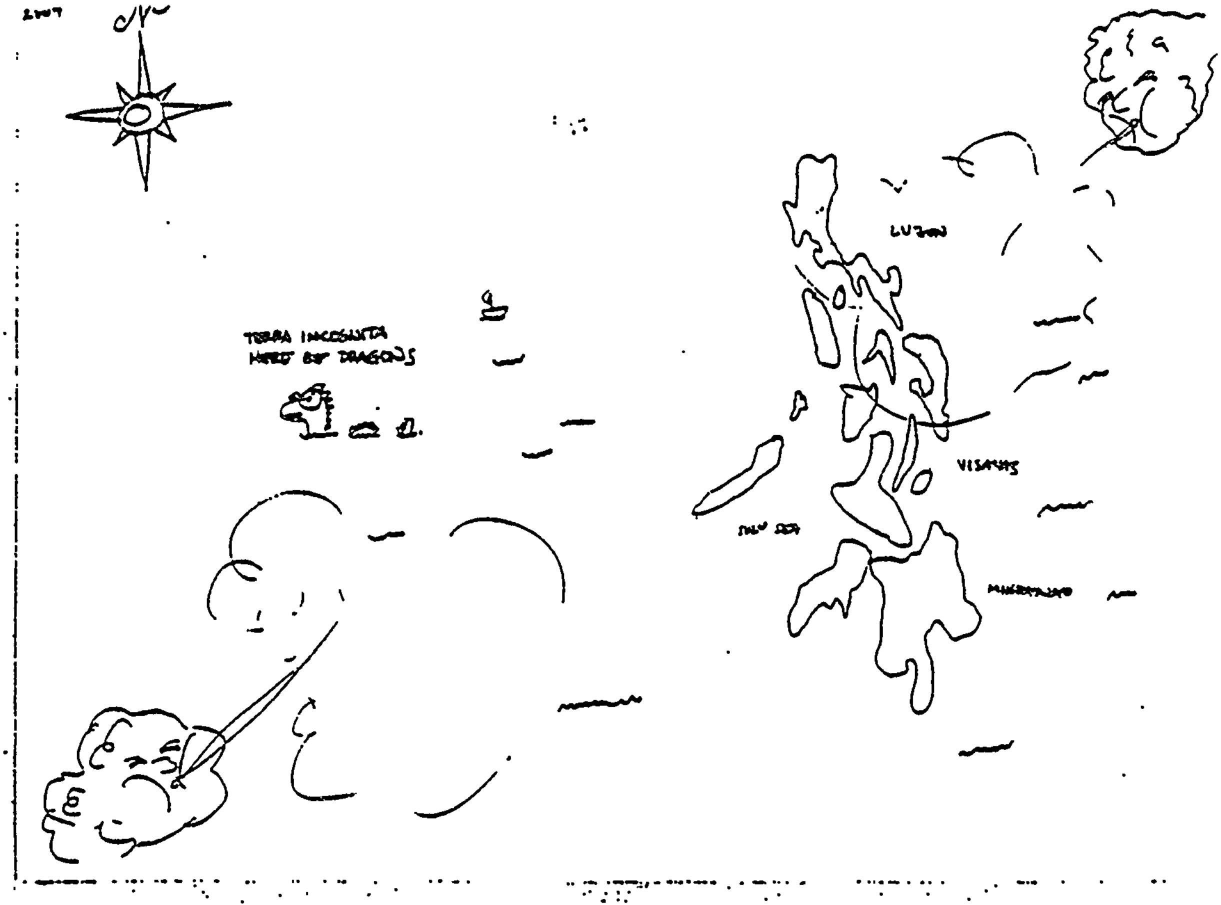
China
India
Vietnam
Indonesia
Polinesia
Oceania
Pacifico
Mexico
Florida
Cuba
Santo Dominicana
Puerto Rico
Nicaragua
canal de panama
Mar Caribe
Venezuela
Isla Galapagos
Colombia
Ecuador
Peru
Bracil
Chile
Argentina
Estrecho de Magallanes
Malvinas
Atlantico
Irlanda
Gran Bretaña
Noruega
Holanda
Francia
Alemania
Suiza
Polonia
Portugal
España
Yugoslavia
URSS
Grecia
Albania
Italia
Mar Mediterraneo
Libia
Africa
Cabo buena Esperanza

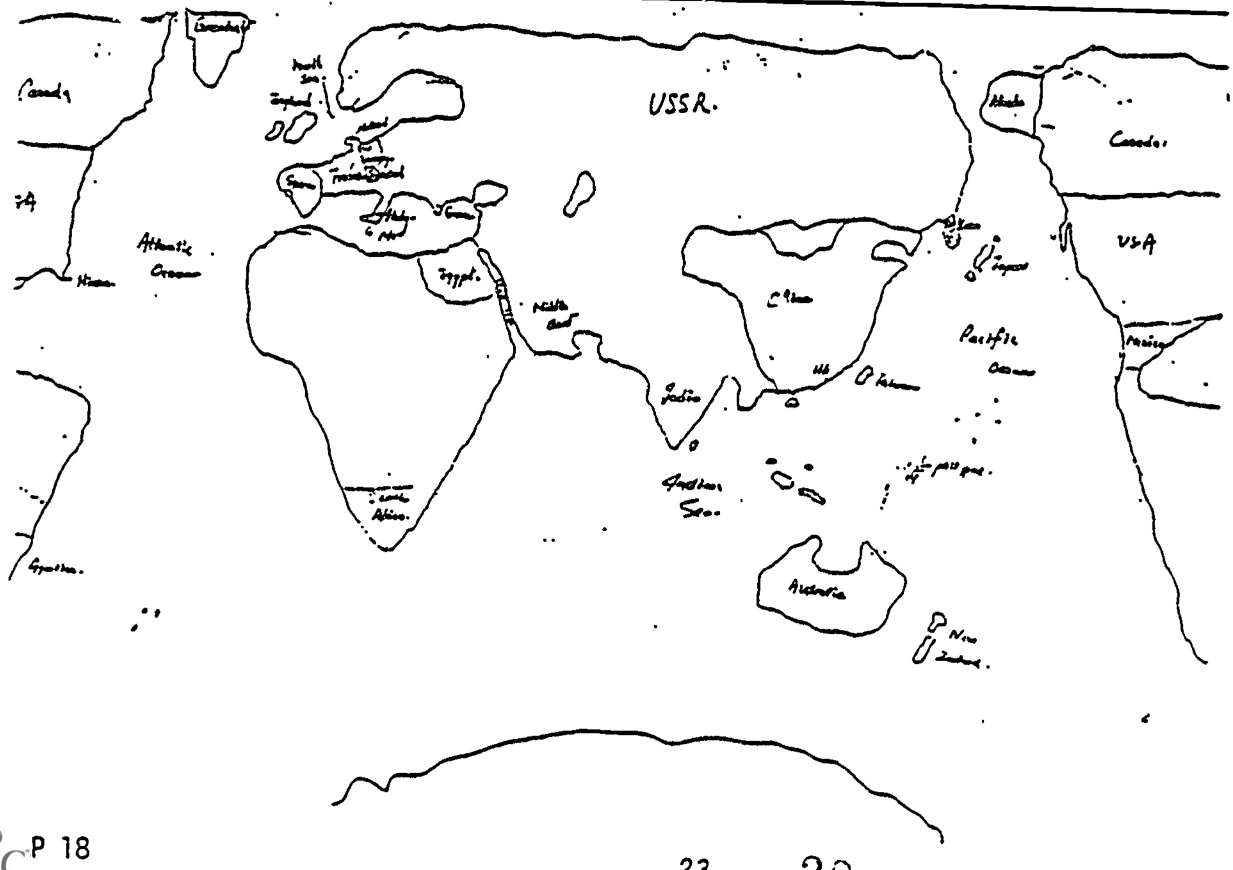
MAP 17


TERRA INCOGNITA
HERE BE DRAGONS
LUZON
VISAYAS
SULU SEA
MINDANAO


Canada
Greenland
North Sea
England
USSR.
Spain
Italy
Greece
Egypt
Atlantic Ocean
South Africa
China
India
Indian Sea.
Japan
Pacific Ocean
Taiwan
Philippines.
Australia
New Zealand.
Alaska
Canada
USA
Mexico

MAP 17


TERRA INCOGNITA
HERE BE DRAGONS
LUZON
VISAYAS
SULU SEA
MINDANAO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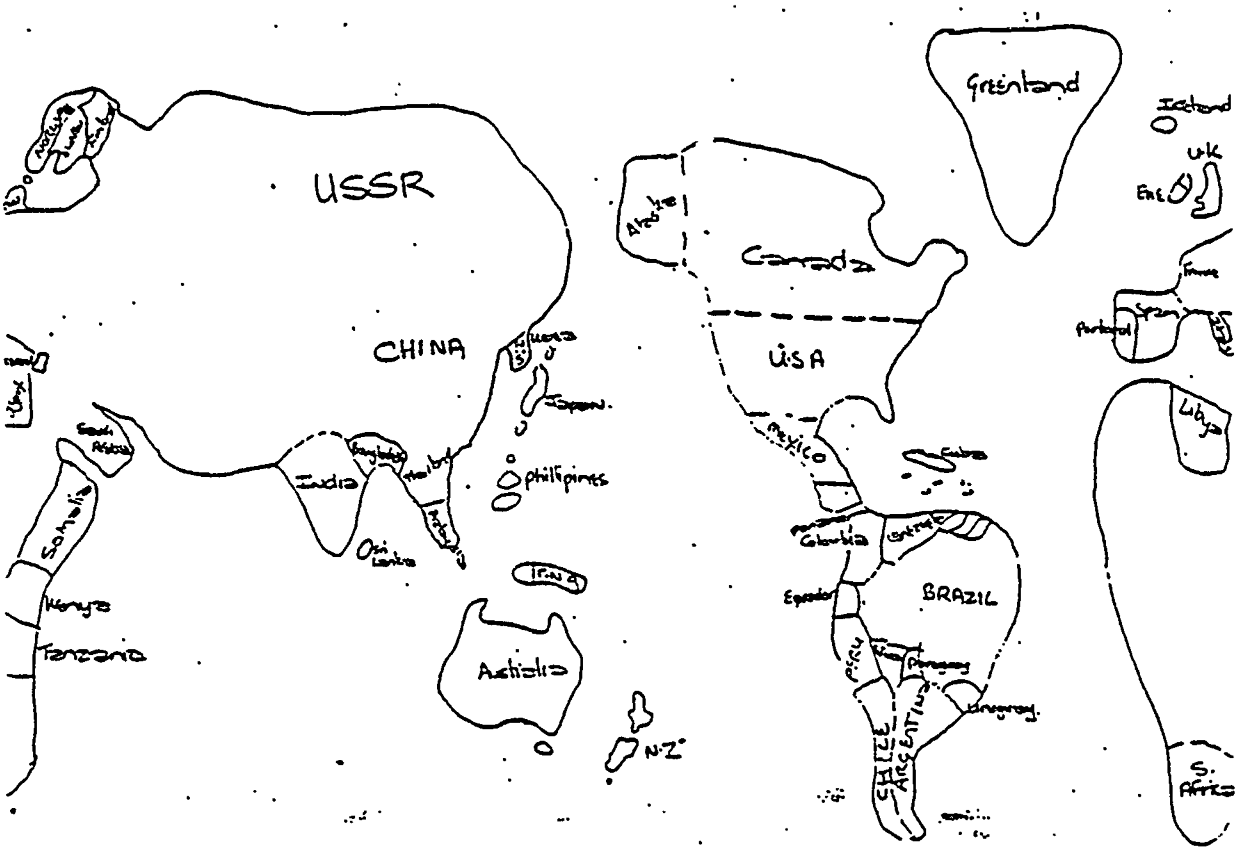
Greenland
North Sea
England
Spain
Italy
Greece
Atlantic Ocean
Egypt
Middle East
South Africa
USSR.
Alaska
Canada
USA
China
Japan
Pacific Ocean
Mexico
India
Taiwan
Indian Sea
Australia
New Zealand

P 18

MAP 19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UK
Eire
USSR
Canada
Alaska
CHINA
Korea
Japan
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Mexico
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Portugal
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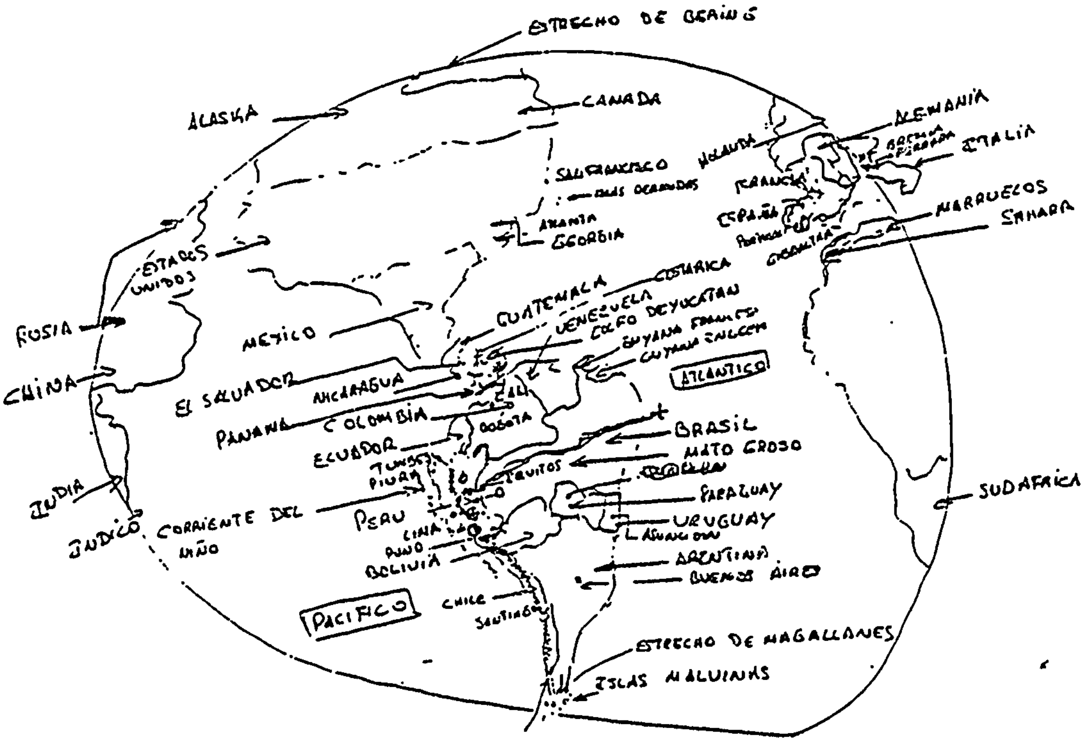
Saudi Arabia
Iraq
India
Bangladesh
Thailand
Sri Lanka
Philippines
Somalia
Kenya
Tanzania
Australia
N.Z.
Colombia
Venezuela
Ecuador
BRAZIL
Peru
Paraguay
Uruguay
CHILE
ARGENTINA
S. Africa

24A

MAP 20


ESTRECHO DE BERING
ALASKA
CANADA
ALEMANIA
ITALIA
HOLANDA
SAN FRANCISCO
FRANCIA
ESPAÑA
PORTUGAL
GIBRALTAR
MARRUECOS
SAHARA
ATLANTA
GEORGIA
ESTADOS UNIDOS
RUSIA
CHINA
MEXICO
GUATEMALA
COSTA RICA
VENEZUELA
GOLFO DE YUCATAN
GUYANA FRANCESA
GUYANA INGLESA
ATLANTICO
EL SALVADOR
NICARAGUA
PANAMA
COLOMBIA
BOGOTA
ECUADOR
TUMBES
PIURA
IQUITOS
BRASIL
MATO GROSO
PARAGUAY
URUGUAY
ASUNCION
INDIA
INDICO
CORRIENTE DEL NIÑO
PERU
LIMA
PUNO
BOLIVIA
ARGENTINA
BUENOS AIRES
PACIFICO
CHILE
SANTIAGO
ESTRECHO DE MAGALLANES
ISLAS MALUINAS
SUDAFRICA

Centering

Variations by region and country in the numbers and proportions of maps centered each way may be seen in Table 1, which is subdivided into large world regions.

Europe and Africa

Table 1.1 is devoted to the European samples and Table 1.2 to Africa. One might expect these maps to be Eurocentric for this would place the mapmaker's own country centrally and show the rest of the world well in relation to the homeland. This is the case. A glance at column three in the first portion of the table shows that for many European countries every sketch map was Eurocentric with the average of 94% for all maps collected in Europe. World sketch maps by African students are more Eurocentric than those from Europe with 98% so centered. Most African samples include neither Americentric nor Sinocentric maps.

Central and South America

Central and South American sketch maps summarized in Table 1.3 show a similar pattern. There is a slight drop in Eurocentric maps with the average for the region at 90%. But one or more students from each country in this region drew Americentric maps of the world. A set of maps from the west coast of South America might have contained a higher proportion of Americentric maps than any collected in this region. For Map 20, drawn by a Peruvian student in Barcelona is clearly Americentric.

Anglo-America

The Anglo-American sample shows some intriguing results in Table 1.4. Column 3 in the last three lines summarizes the basic differences. Anglo-Americans as a group still tend to draw Eurocentric maps of the world but the

Centering of World Sketch Maps (in percentages)

Table 1.1 Europe

Country	n	Eurocentric		Americentric		Sinocentric		Other	
		n	%	n	%	n	%	n	%
England Oxford	65	59	91	6	9	0	0	0	0
France Paris	47	47	100	0	0	0	0	0	0
Hungary * Budapest	22	21	95	1	5	0	0	0	0
Italy * Milan	61	54	89	1	1.5	1	1.5	5	8
Norway * Trondheim	37	34	92	0	0	0	0	3	8
Poland Lodz	21	21	100	0	0	0	0	0	0
Portugal Lisbon	129	128	99	1	1	0	0	0	0
Spain * Barcelona	63	61	97	1	1.5	1	1.5	0	0
Switzerland Geneva	26	24	92	1	4	0	0	1	4
Turkey * Istanbul	89	75	84	3	3	1	1	10	11
West Germany * Marburg	19	19	100	0	0	0	0	0	0
West Germany Marburg	17	17	100	0	0	0	0	0	0
Yugoslavia Ljubljana	44	42	95	0	0	1	2.5	1	2.5
Total Europe	640	602	94	14	2	4	1	20	3

ERIC
Full Text Provided by ERIC

Table 1.2 Africa

		Eurocentric		Americentric		Sinocentric		Other	
Country	n	n	%	n	%	n	%	n	%
Ivory Coast Abidjan	72	71	99	1	1	0	0	0	0
Kenya Nairobi	10	10	100	0	0	0	0	0	0
Madagascar Atananarive	171	167	98	1	.5	0	0	3	1.5
Morocco * Rabat	100	94	94	0	0	0	0	6	6
Nigeria Benin City	59	57	97	2	3	0	0	0	0
Rwanda Ruhengeri	18	18	100	0	0	0	0	0	0
Togo Lome	71	71	100	0	0	0	0	0	0
South Africa Capetown[a]	70	64	91	2	3	0	0	4	6
South Africa Stellenbosch[a]	136	136	100	0	0	0	0	0	0
South Africa West Cape[a]	61	61	100	0	0	0	0	0	0
Zimbabwe Harare	31	31	100	0	0	0	0	13	0
Total Africa	799	780	98	6	.8	0	0	13	1.6

ERIC

Table 1.3 Central and South America

Country	n	Eurocentric n	Eurocentric %	Americentric n	Americentric %	Sinocentric n	Sinocentric %	Other n	Other %
Argentina Buenos Aires	38	29	76	5	13	0	0	4	11
Argentina Mendoza	30	28	93	2	6.5	0	0	0	0
Argentina Neuquen	35	34	97	1	3	0	0	0	0
Bahamas Nassau	80	77	96	1	1	0	0	2	3
Brazil Belo Horizonte *	21	19	90	2	10	0	0	0	0
Brazil Belo Horizonte	17	17	100	0	0	0	0	0	0
Columbia Santa Maria	22	17	77	1	4.5	1	4.5	3	14
Costa Rica San Jose	16	14	88	2	13	0	0	0	0
Mexico Guadalajara	39	35	90	2	5	0	0	2	5
Venezuela Caracas	63	55	87	5	8	1	1.5	2	3
Total Central and South America	361	325	90	21	6	2	.5	13	4

34

Table 1.4 Anglo-America

Country	n	Eurocentric n	Eurocentric %	Americentric n	Americentric %	Sinocentric n	Sinocentric %	Other n	Other %
Canada Edmonton	34	28	82	5	15	0	0	1	3
Canada[b] Ottawa - English *	77	62	81	14	18	0	0	1	1
Canada[b] Ottawa - French *	60	53	88	6	10	0	0	1	2
Canada Vancouver	85	65	76	18	21	0	0	2	2
U.S.A. Chicago	37	28	76	5	14	0	0	4	11
U.S.A. Fairbanks *	55	29	53	21	38	4	7	1	2
U.S.A. Honolulu	19	12	63	5	26	0	0	2	11
U.S.A. Miami *	43	35	81	6	14	1	2	1	2
U.S.A Philadelphia	31	16	52	11	35	0	0	4	14
U.S.A. Seattle	371	232	63	92	25	19	5	28	8
U.S.A. Tucson	72	54	75	13	18	1	1	4	6
Total Canada	256	208	81	43	17	0	0	5	2
Total U.S.A.	628	406	65	153	24	25	4	44	7
Total Anglo-America	884	614	69	196	22	25	3	49	6

proportion dropped to 69% considerably lower than in Europe, Africa, or Latin America. Even more interesting is the contrast between Canadians and Americans. The American maps are less Eurocentric than the Canadian maps and in Ottawa the Francophone students are more Eurocentric than the Anglophones, but less Eurocentric than the Central and South Americans. One extreme example of a Eurocentric map by a Francophone student from the University of Ottawa is shown in Map 21.

There are longitudinal differences within the Anglo-American samples. The sample farthest west, Fairbanks, Alaska, gave the highest proportion of Americentric maps at 38% as well as the highest proportion of Sinocentric maps at 7%. In general the further west the sample site, the higher the proportion of Americentric maps. The major exceptions, in the United States, are the 2 sites with smallest sample numbers, Honolulu and Philadelphia. The relationship is not as clear in Canada but in Vancouver, the most westerly Canadian site sampled, 21% of the maps were Americentric, the highest proportion in Canada. Seattle, at virtually the same longitude as Vancouver, had 4% more Americentric maps, maintaining the Canadian-American differential.

Oceania

Sinocentric maps become dominant in Oceania. Table 1.5 indicates that over 70% of the sketch maps collected from New Zealand, Australia, and Papua, New Guinea are Sinocentric. This type of map is appropriate for these areas because it places the home country more centrally and indicates the distance and direction to other places. In contrast, the Eurocentric map would place these countries way off on the edge. There are also longitudinal differences in this table. The Dunedin sample, the farthest east site, had 79% Sinocentric maps, those from Armidale 73%, Papua New Guinea 72%, and Adelaide only 35%. A recently received sample of 110 students from Perth had only 42% Sinocentric

MAP 21 le monde

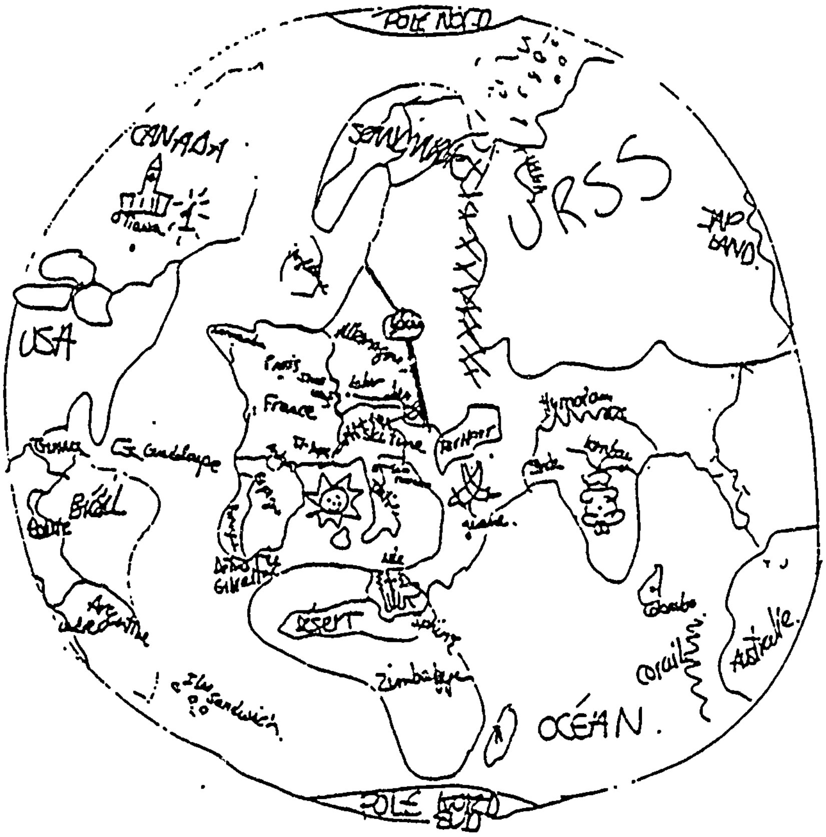

POLE NORD
CANADA
Ottawa
USA
URSS
JAPAND.
France
Paris
Allemagne
Guadeloupe
Brésil
Argentine
Iles Sandwich
Détroit de Gibraltar
Désert
Himalaya
Colombo
Zimbabwe
OCÉAN.
Australie.
POLE NORD SUD

Table 1.5 Oceania

Country	n	Eurocentric		Americentric		Sinocentric		Other	
		n	%	n	%	n	%	n	%
Australia Adelaide	17	9	53	0	0	6	35	2	12
Australia Armidale	89	15	17	1	1	65	73	8	9
New Zealand Dunedin	67	4	6	9	13	53	79	1	1
Papua New Guinea * Boroko	18	2	11	2	11	13	72	1	6
Total Oceania	191	30	16	12	6	137	72	12	6

Table 1.6 Asia

Country	n	Eurocentric		Americentric		Sinocentric		Other	
		n	%	n	%	n	%	n	%
Bangladesh Dacca *	29	29	100	0	0	0	0	0	0
China Peoples Republic Peking	26	0	0	0	0	26	100	0	0
China Peoples Republic * 3 sites	49	5	10	0	0	44	90	0	0
China[c] R.O.C. 1 * Taipei	35	6	17	3	9	23	66	3	9
China[c] R.O.C. 2 * Taipei	33	14	42	0	0	15	45	4	12
Hong Kong[d] Chinese Univ.	102	71	70	0	0	23	23	8	8
Hong Kong[d] University of H.K.	67	63	94	0	0	4	6	0	0
India Jodhpur *	41	41	100	0	0	0	0	0	0

Table 1.6 Asia (continued)

Country	n	Eurocentric		Americentric		Sinocentric		Other	
		n	%	n	%	n	%	n	%
India Pune	39	35	90	0	0	0	0	4	10
Indonesia Jogjakarta	26	6	23	0	0	18	69	2	8
Iran * Teheran	23	23	100	0	0	0	0	0	0
Israel Beer Sheva	25	21	84	0	0	0	0	4	16
Japan * Tokyo	20	1	5	0	0	19	95	0	0
Kuwait *	39	35	90	1	2.5	0	0	3	7.5
Pakistan * Karachi	14	13	93	0	0	0	0	1	7
Phillipines * Quezon City	52	42	81	3	6	3	6	4	8
Saudi Arabia * Mecca	51	46	90	0	0	0	0	5	10
Singapore *	37	30	81	0	0	3	8	4	11
South Korea Seoul	73	2	3	0	0	68	93	3	4
Thailand * 5 Sites	207	200	97	2	1	0	0	5	2
Total Asia	988	683	69	9	1	246	25	50	5

Table 1.7 Totals

		Eurocentric		Americentric		Sinocentric		Other	
	n	n	%	n	%	n	%	n	%
Total World	3863	3034	79	258	7	414	11	157	4
Total World Collected-64%	2488	1913	77	190	8	286	11	99	4
Total World Sent-36%	1375	1120	81	67	5	128	9	60	4

* These samples were sent by cooperators. All others were collected on site by the principal investigator or his research assistant.

a In the vicinity of Capetown 3 sets of maps were obtained, one from the English-speaking University of Capetown, another from the AFrikaans-speaking Stollenbosch University, and a third from West Cape University, where the students are colored.

b In Ottawa 2 sets of maps were collected, one from the English-speaking Carleton University, the other from the French-speaking University of Ottawa.

c Two separate sets of maps were received from Taiwan.

d In Hong Kong, 2 separate sets of maps were collected; one from the Chinese University of Hong Kong in which instruction is in Chinese, the other from the University of Hong Kong where instruction is in English.

maps. The major exceptions to a clear longitudinal pattern of rising percentages of Sinocentric maps with increasingly easterly longitude, was Adelaide, the site with the smallest sample.

Asia

The Asian data shown in Table 1.6 completes the picture. Within the table are countries like Bangladesh, India, Pakistan, Kuwait, and Saudi Arabia where virtually all maps were Eurocentric as well as others like China, South Korea, and Japan where almost all were Sinocentric. There were very few countries with any balance between them; either one type or the other predominated.

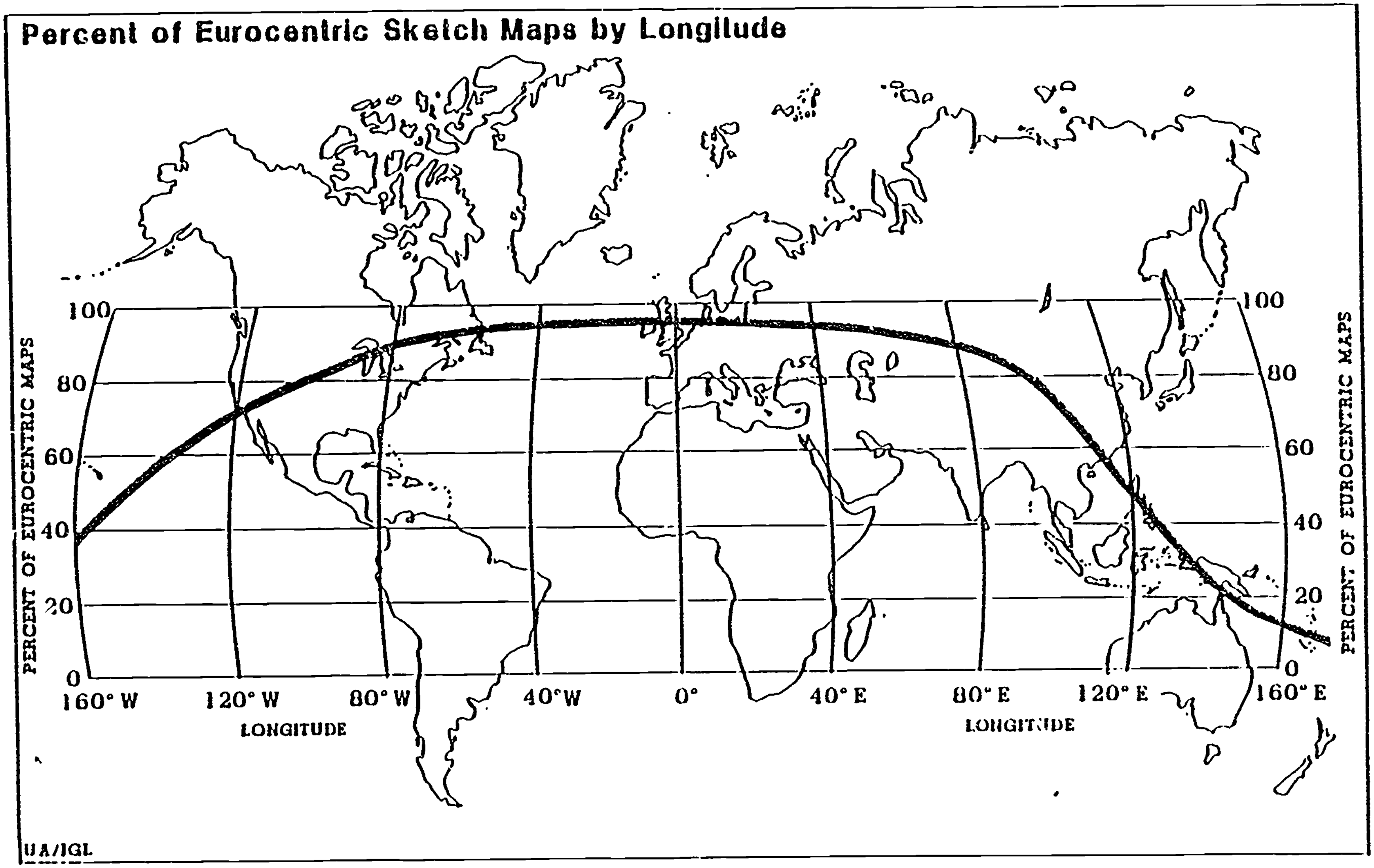
Longitude once more provides a clue. The Asian countries where predominantly Sinocentric maps were drawn are those on the eastern rim of Asia, while those with predominantly Eurocentric images are in western or southern Asia.

The World Pattern

Map 22 is a generalized pattern for the entire world sample. Clearly the predominant factor explaining deviations from the norm of the conventional Eurocentric map of the world is longitude. Judging from the sketch maps collected, people in most countries are quite content to use the Eurocentric map of the world. And, by and large, it serves reasonably well in terms of indicating the location of each country in relation to the rest of the world.

It is in the countries that appear on the edges of conventional Eurocentric maps of the world that dissatisfaction develops. This happened first almost four centuries ago in China where dissatisfaction with the newly createc Eurocentric map of the world led to the development of the first Sinocentric version. It probably also became the standard image of the world in countries like South Korea and Japan whose histories were closely entwined with China.

MAP 22



Percent of Eurocentric Sketch Maps by Longitude

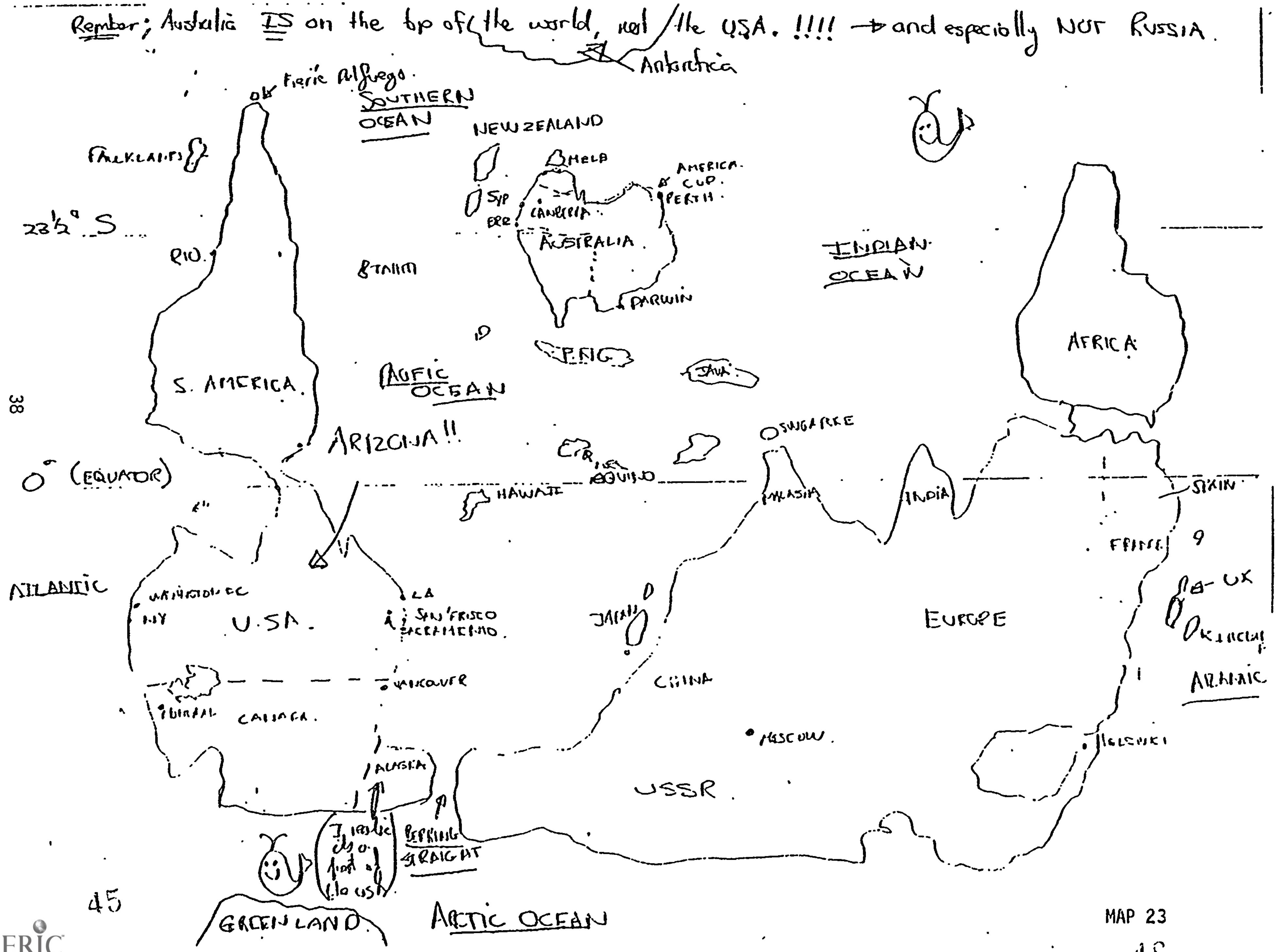
At a more recent date, Sinocentric maps were accepted as more appropriate for their countries by Indonesia, Papua New Guinea, Australia, and New Zealand. In Australia the major shift to the Sinocentric image began in the late 1960s when the Jacaranda Press of Brisbane began to use such maps in their school atlases (R. Gerber personal communication). The complete shift from a down under to an up over Sinocentric map has not yet taken place although a few Australian and New Zealand students did provide us with such a version (Map 23). It is more appropriate for people from this part of the world than the Eurocentric view which might not only place their country off on the bottom edge of the world but risk cutting it in half as in humorous Map 24 by a student from Armidale, Australia.

The Americentric world map appears to have originated on the east coast of the United States, at the time of a swelling sense of national pride, but it was most commonly drawn by students in locations on the western extremities of North America. As in East Asia and Oceania the use of a Eurocentric map would place them on the periphery of the world. So some prefer to switch to the Americentric map, or even a Sinocentric map, which better illustrates their location in relation to the rest of the world.

The Colonial Influence in Asia

Longitude, although a dominant factor does not entirely explain the world pattern of sketch map centering, particularly in Asia. The tradition of using Eurocentric maps by educational systems in many Asian countries is strong (Table 1.6). These educational systems could just as effectively use Sinocentric maps to place their country in relation to the rest of the world. This would be true for India, Pakistan, and Bangladesh where the sketch maps were virtually all Eurocentric. Even more indicative of the hold of European educational systems are the results for such places as Hong Kong, Singapore, the Philippines and

Rembor; Australia IS on the top of the world, not the USA. !!!! → and especially NOT RUSSIA.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DARWIN
23½° S
RIO
TAHITI
INDIAN OCEAN
AFRICA
P.N.G.
JAVA
S. AMERICA
PACIFIC OCEAN
ARIZONA!!
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INDIA
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FRANCE
ATLANTIC
WASHINGTON DC
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U.S.A.
LA
SAN FRISCO
SACRAMENTO
JAPAN
EUROPE
UK
ATLANTIC
CHINA
VANCOUVER
MONTREAL
CANADA
MOSCOW
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USSR
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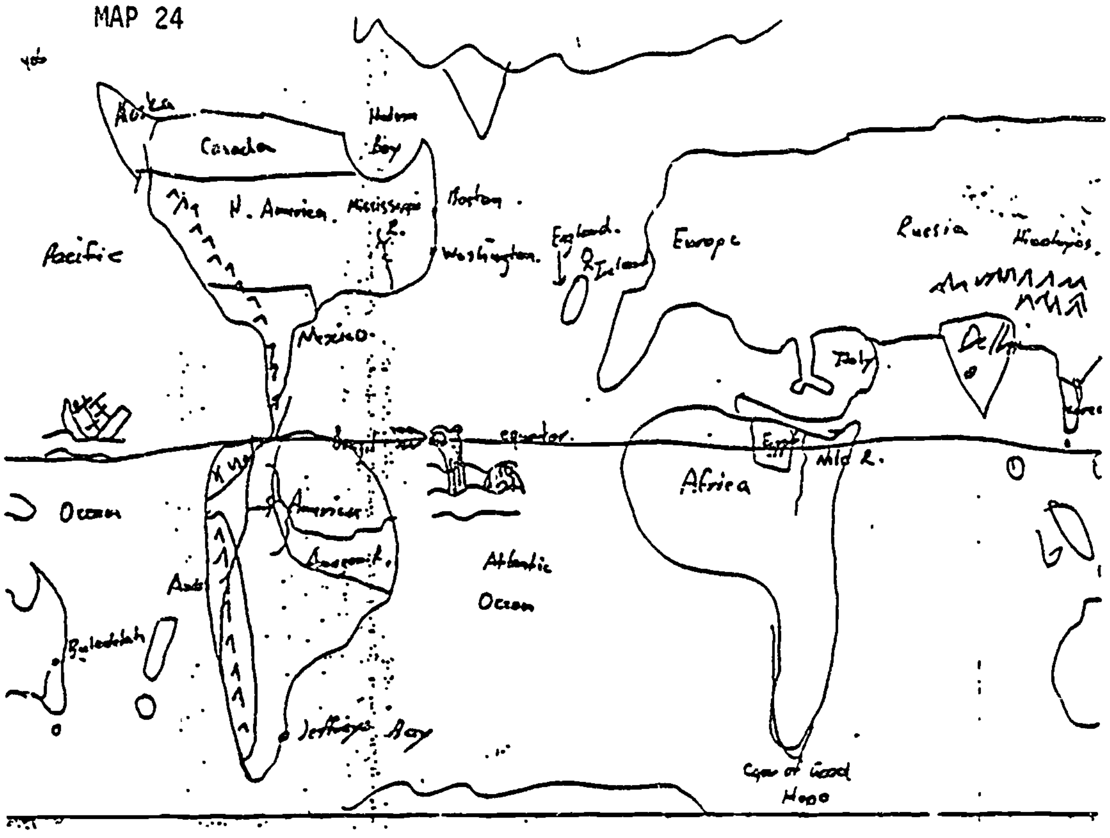
I think its a part of the USA
GREENLAND
ARCTIC OCEAN

MAP 23

MAP 24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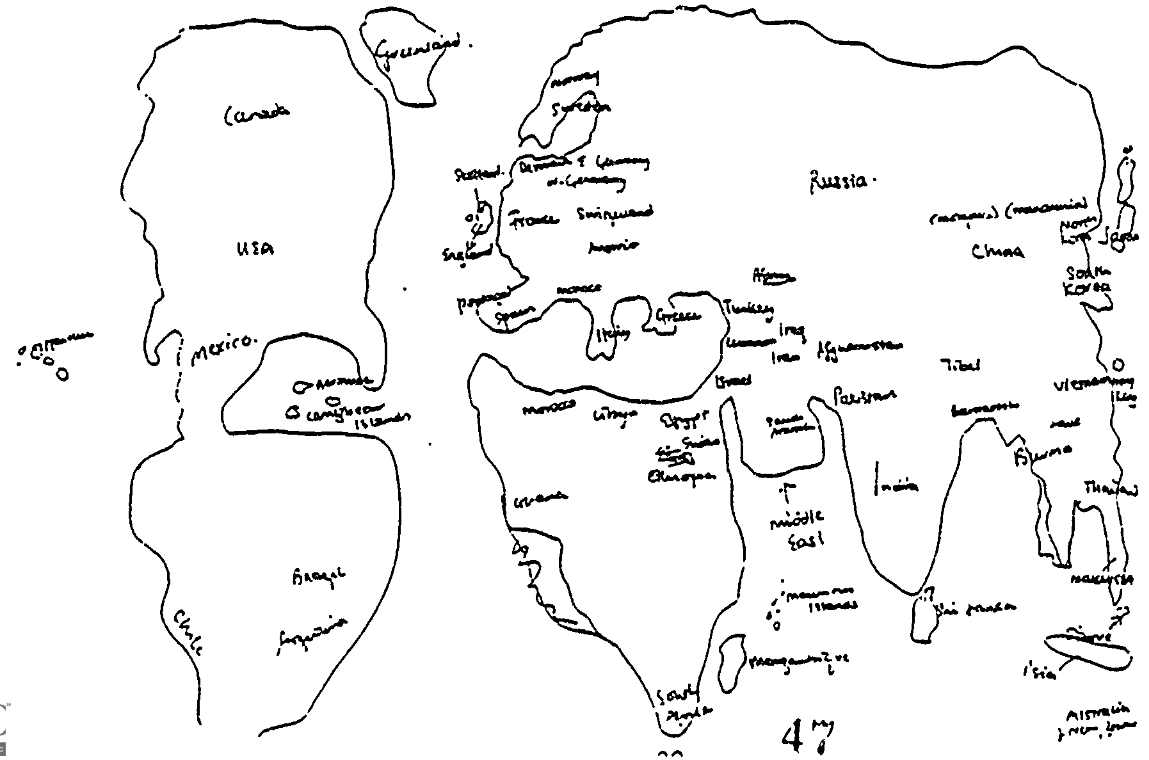
Cape of Good
Hope

MAP 25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Greece
Turkey
Iraq
Iran
Afghanistan
Israel
Russia
China
North Korea
Japan
South Korea
Tibet
Pakistan
India
Burma
Vietnam
Thailand
Malaysia
Morocco
Libya
Egypt
Sudan
Ethiopia
Ghana
middle
East
South Africa
Australia

Thailand, where most students sketched Eurocentric maps even though their countries were thereby in peripheral positions (e.g., Map 25 from Singapore). This illustrates one of the unfortunate characteristics of colonial mentality, the idea that the center lies elsewhere (Henrikson in press).

One example is the Hong Kong students who, in striking contrast to the Chinese, drew mainly Eurocentric maps. Clearly the British tradition in teaching geography is still effective. This is most evident among the maps of the students from the University of Hong Kong where the instruction is in English. There 94% drew Eurocentric maps. The maps from the Chinese University of Hong Kong, where the instruction is in Chinese, reflect a greater Chinese influence with 23% Sinocentric maps. It would seem that the current language of instruction has not overcome whatever factors have created this Eurocentric image of the world. These factors probably include the long-term colonial atmosphere of the local society and the formal educational process. In Taiwan there has more recently been a separation from the mainland and a strong identification with the West and Western geographical education. The Eurocentric map, while more common in Taiwan than in most student maps of adjacent portions of East Asia, is much less important than in Hong Kong with its longer colonial ties.

Conclusions

The massive archive of sketch maps of the world assembled for this project provides a rich resource for investigating variations in images of the world and for raising and answering questions about the reasons for the differences. In this preliminary paper, only one element was discussed: how the sketch maps are centered. This raised provocative questions about the largely Eurocentric image of the world and the role of geographic location in maintaining and modifying it. By focusing on the way the maps are centered, this paper illustrated the importance of longitude in selections of the center and the strength of colonial images along the periphery. But one should not imagine that colonial images remain only in such locations. Further analysis of sketch map data such as the pattern of inclusion of various countries, or the relative exaggeration of various continents will reveal in more detail systematic differences in current images of the world.

Judging from this preliminary analysis, a colonial mentality and Eurocentric image of the world still remains dominant in many places a quarter of a century after the end of the colonial era. This suggests a long lag time between change in political status and its reflection in images of the world. But it would appear that changes in world images do take place as in the contrast between China and Taiwan, or perhaps in the shift from Eurocentric images in Australia following the first appearance in school atlases of Sinocentric maps. Geographic education could play a key role in helping to modify our old Eurocentric world images to fit a newer more egalitarian concept.

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