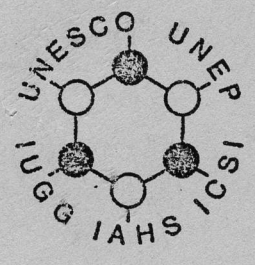

Temporary Technical Secretariat for
WORLD GLACIER INVENTORY
International Commission on Snow and Ice

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Instructions for Compilation and Assemblage of Data for a World Glacier Inventory

Supplement:

IDENTIFICATION / GLACIER NUMBER

Department of Geography
Swiss Federal Institute of Technology (ETH)
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1978

Introduction

The TTS "Instructions for Compilation and Assemblage of Data for a World Glacier Inventory" (Müller et al., 1977) have been criticized by some local investigators. They say that the chapter "Identification/Glacier Number" (page 8) does not account for pecularities of the drainage networks of their regions. The UNESCO/TTS identification system works quite well in relatively small drainage basins, e.g. in Western and Central Europe. If we try to apply it to the immense catchment areas of the World's largest rivers we run into troubles. Inevitably we end with fourth order drainage basins of the size of medium size countries of Europe, as is shown in Figure 1.

Admittedly this system is inappropriate for our purpose. Therefore, the TTS has developed a new coding system, based on hydrological considerations. This new system can be easily adopted by workers who have coded their regions according to the old system, and yet it is somewhat stricter than before.

The New Identification System

The new identification system is based essentially on hydrological considerations. We use the inverse STRAHLER orders for streams. Figure 2 shows the principles governing the ordering of streams in a given drainage basin (after Strahler, 1969).

Two streams of a given order N form at their junction a river of the order N - 1. A river flowing into one of lower order does not change the order of the latter. Instead of rivers one can speak of the respective drainage basins, i.e. a river of order N has a drainage basin of order N.

It is obvious that the given orders are dependent on the base map used, i.e. on the generalization applied. Therefore, we have to agree on one single base map in order to achieve a uniform classification. We suggest using the maps to the scale 1 : 20 Mio. given in the appendix (after Lautensach, 1955).

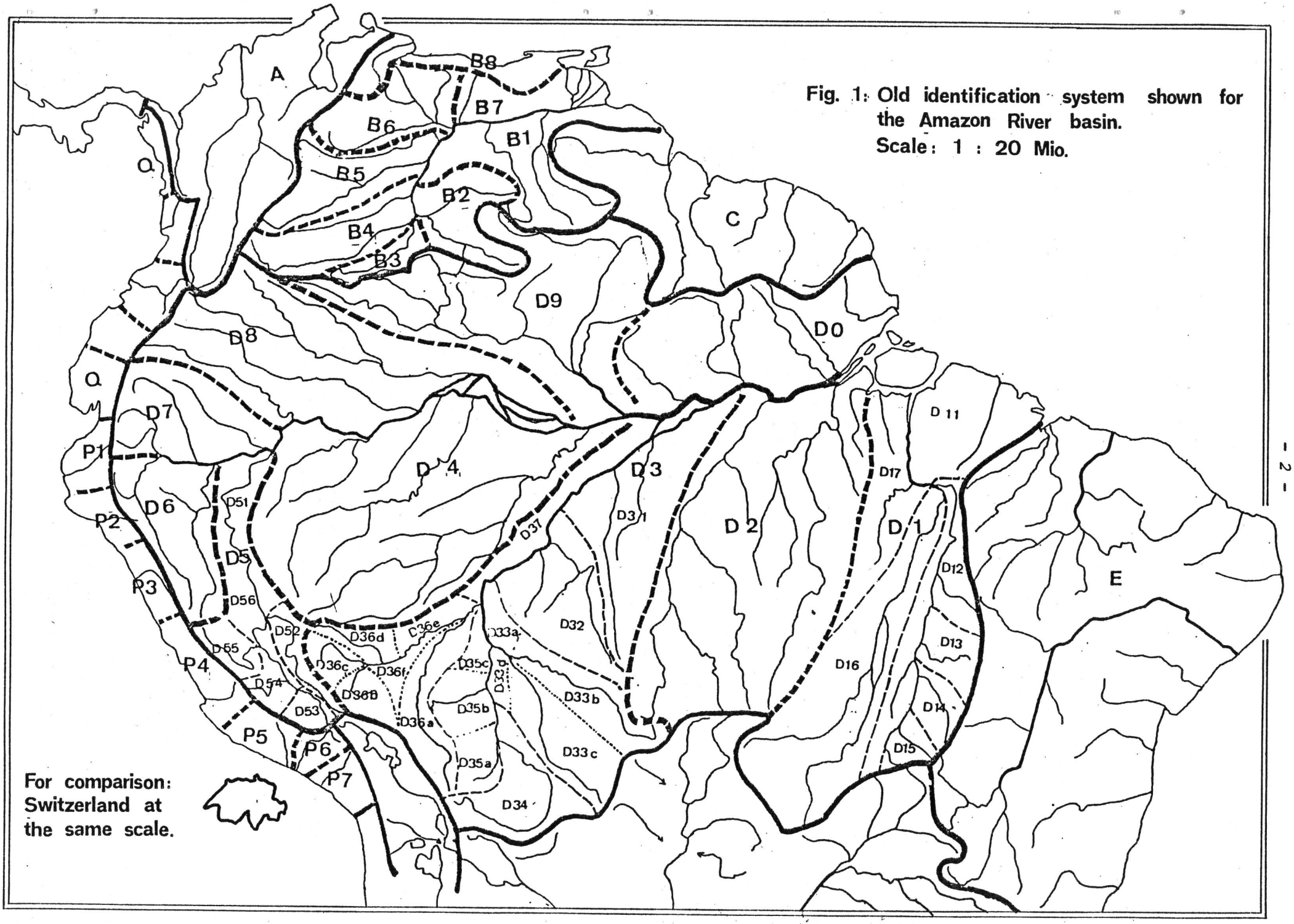


Fig. 1: Old identification system shown for the Amazon River basin.
Scale: 1 : 20 Mio.

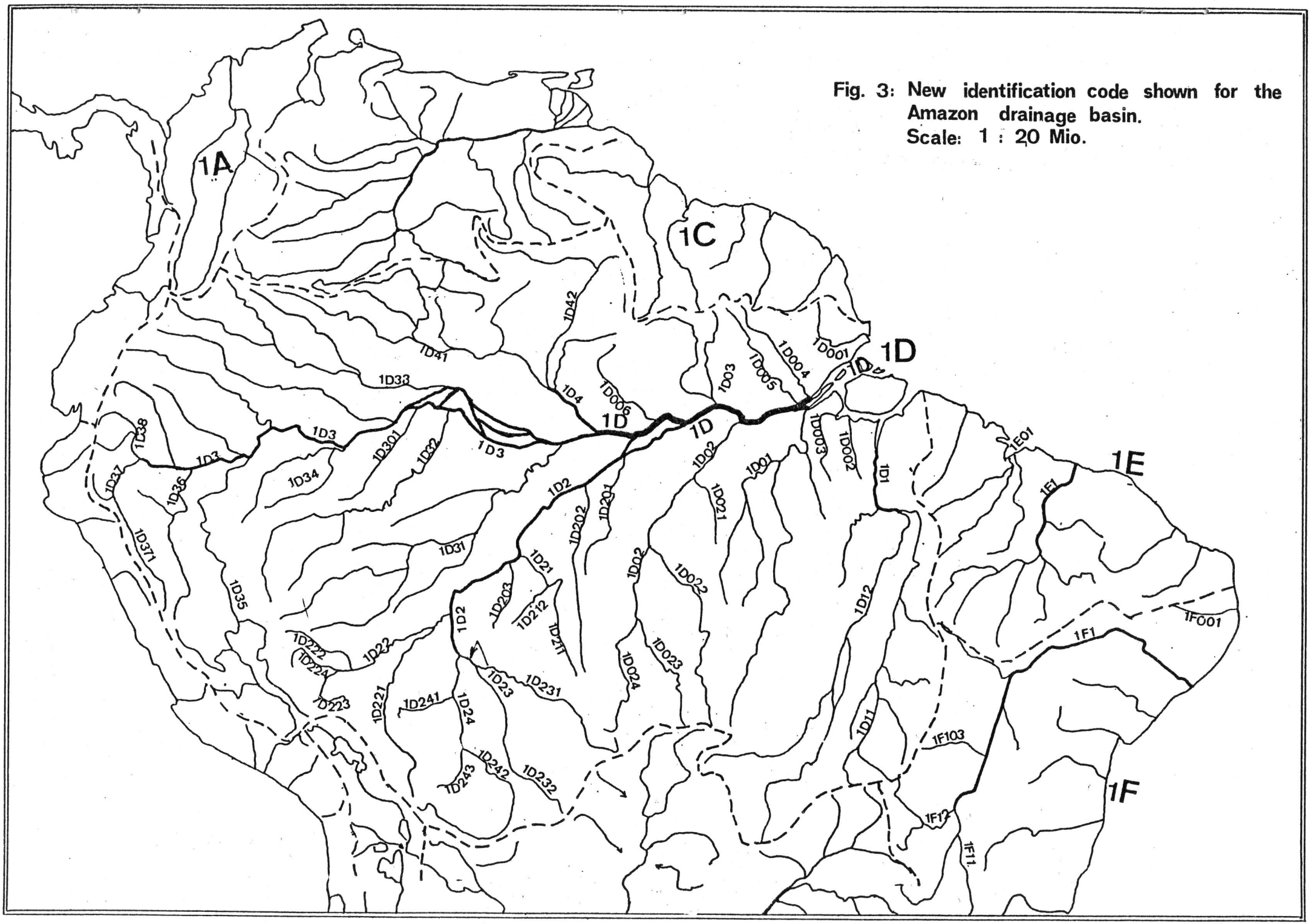


Fig. 3: New identification code shown for the Amazon drainage basin.
Scale: 1 : 20 Mio.

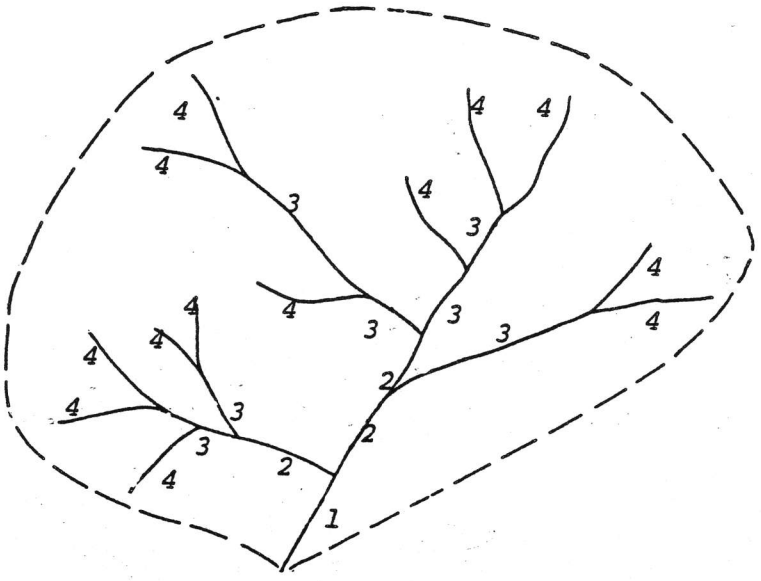


Fig. 2: Inverse Strahler order

Example: The Amazon River Basin

Let us explain the new identification system using a map of the Amazon River Basin (Figure 3). We start by assigning STRAHLER orders to every river depicted on this map. The smallest ones get - by definition - order four. Proceeding in the manner which we described above, the main trunk of the Amazon gets order 1. Each order is assigned a fixed position on the punching card, as was the case in the old system, too. (Figure 4).

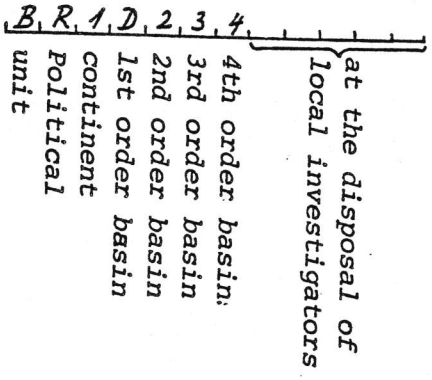


Fig. 4 : Identification system: example

The continents are subdivided into regions which are designated by letters (see maps in the appendix). These regions correspond - again by definition - to drainage basins of first order. The Amazon River is coded, therefore, in its main trunk below the confluence with Rio Negro (Fig. 3):

B R 1 D 0 0 0 0 0 0 0 0 0

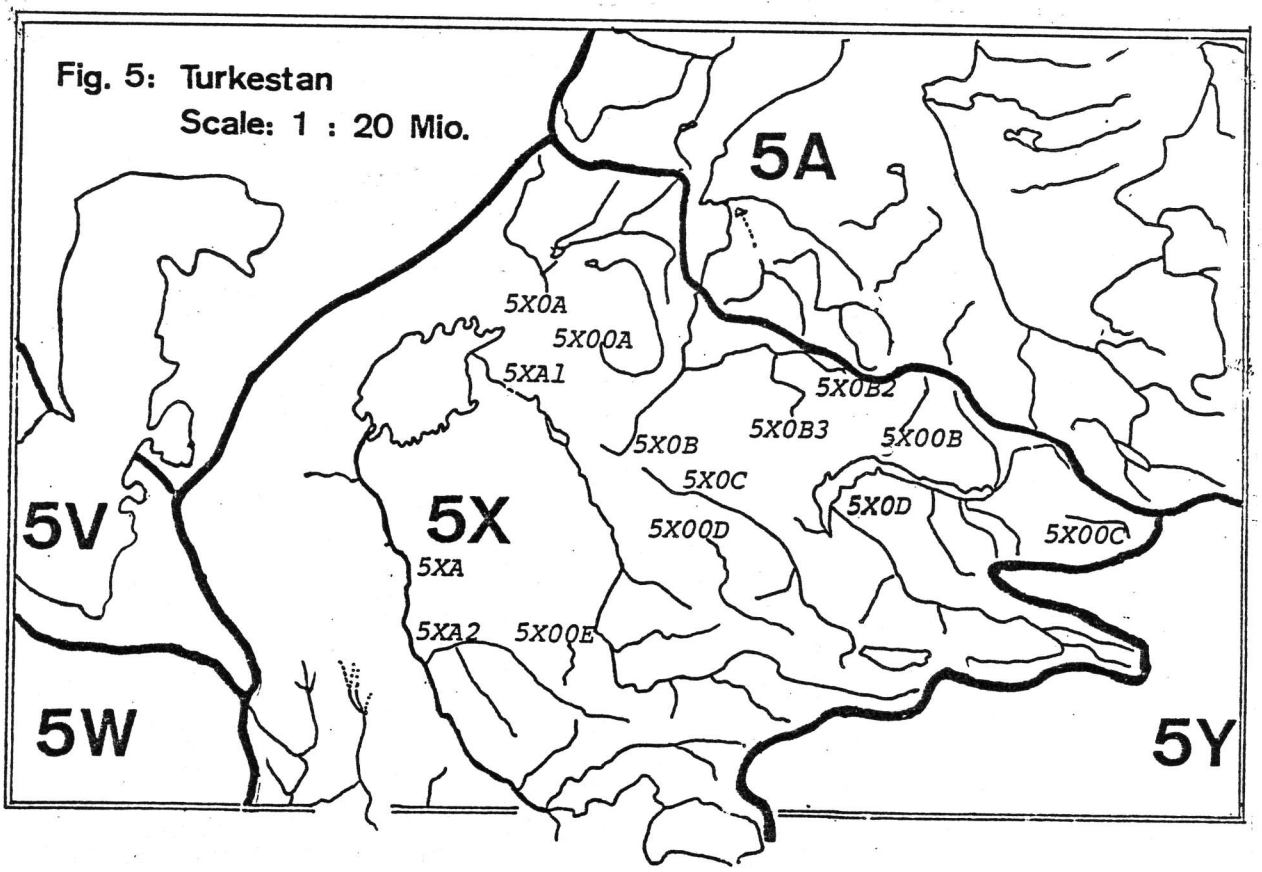
The zeros can be dropped. In the context of these explanations the political unit does not matter at all, therefore, we can drop the digits BR, too.

The lower order rivers flowing into the Amazon River are counted upstream, their numbers being put in the appropriate punching position. 1 D 0 1 for example is the first 3rd-order river flowing into the Amazon River, 1 D 0 0 3 the third fourth-order river. Essentially, the same procedure is applied to the tributaries of the Amazon River. 1 D 1 0 3 is the third fourth-order river flowing in the first second-order tributary of the Amazon River- everything counted upstream. Where two streams of higher order meet and form a river of lower order, the two high-order rivers are counted clockwise. In this way the Rio Negro is 1 D 3 and the upper reaches of the Amazon River are 1 D 4.

Other examples

Consider the region 1 E (Fig. 3). This region is - by definition - of first order. There is one second-order river in this region which gets the code 1 E 1. The third-order river east of 1 E 1 becomes 1 E 0 1 and the fourth-order streams flowing directly into the sea are counted clockwise along the coast: 1 E 0 0 1, 1 E 0 0 2, etc.

Many rivers in arid regions do not reach the ocean. In those cases we propose to start counting in the North of the respective region of first order and to proceed in a clockwise spiral towards the center, using letters instead of numbers. The tributaries of these evaporating streams are treated in the way explained in the above paragraphs. An example is given in Fig. 5.



Local Identification System

For the above discussions we have only used the punching positions 1 to 7. The remaining five positions from 8 to 12 are entirely at the disposal of local investigators. Theoretically, the TTS ordering system could be continued up to any order, however, you may get in conflict with the assigned computer space. Therefore, we only urge the use of the TTS system up to fourth-order rivers, in order to achieve a uniform coding system for the larger drainage basins. It is possible that some local investigators would classify a stream which is not to be found in the maps of the appendix as being of fourth order. In these cases they can complete the map, but only in such a way, that other collaborators working in the same drainage basin are not influenced. In any case the TTS has to approve the changing.

In order to make it possible to identify every single glacier, the local investigators must provide sketch maps of their region where local code is fully explained.

It will be noted that there are now only two punching positions assigned to political units. A list of the new abbreviations which are still based on the official signs for automobiles, is given in the appendix.

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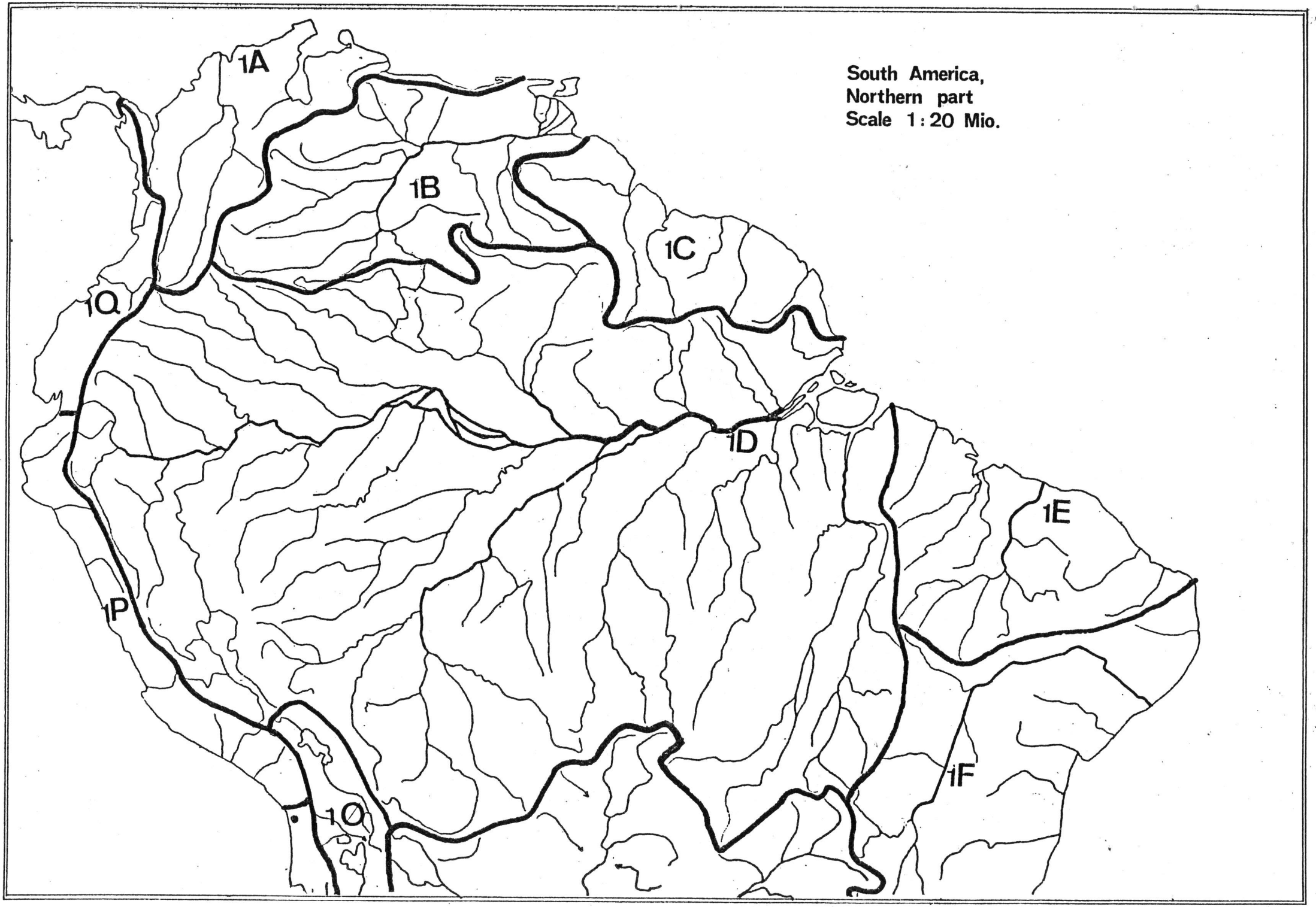
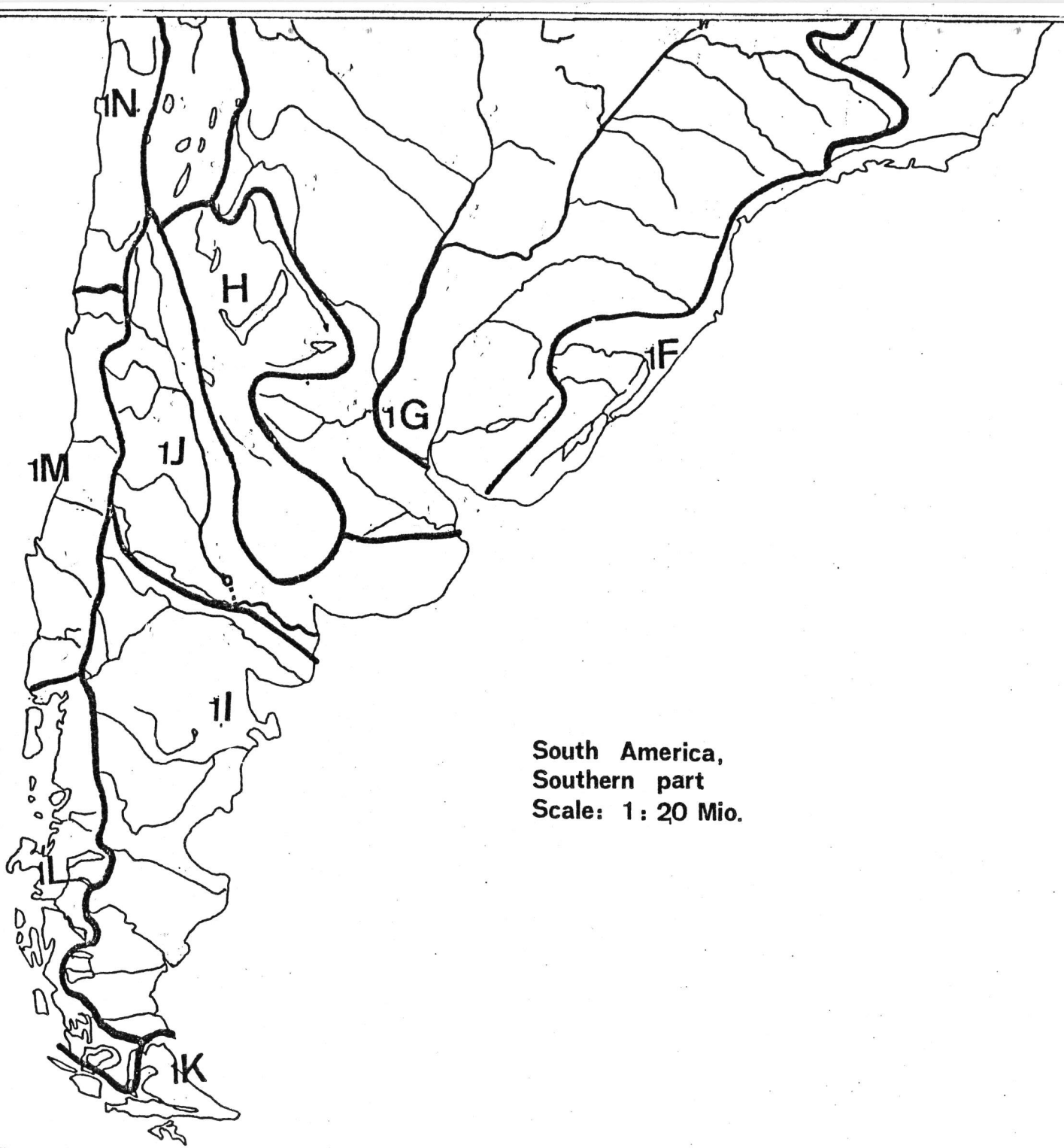
Appendix

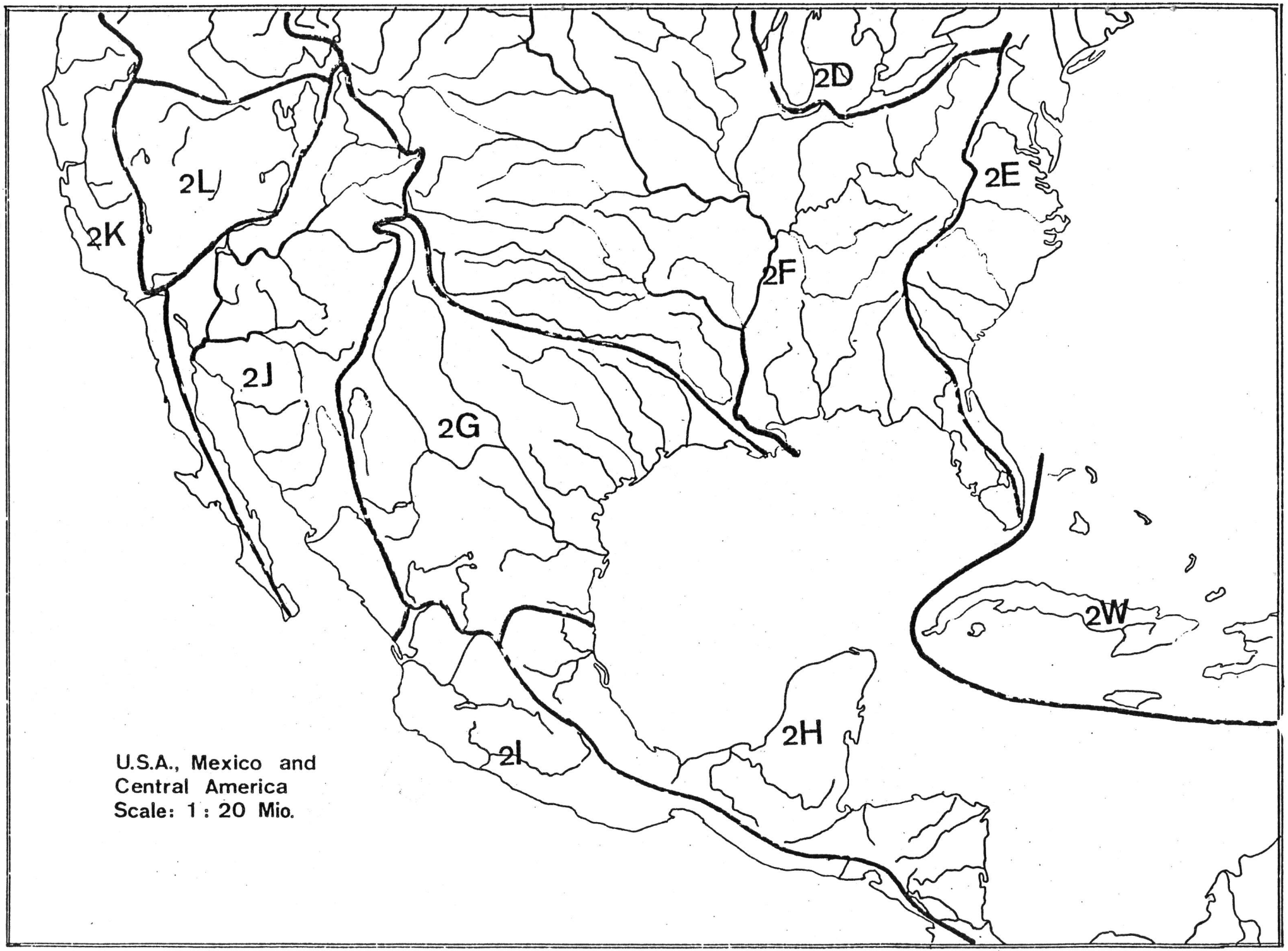
Denotation of Political States

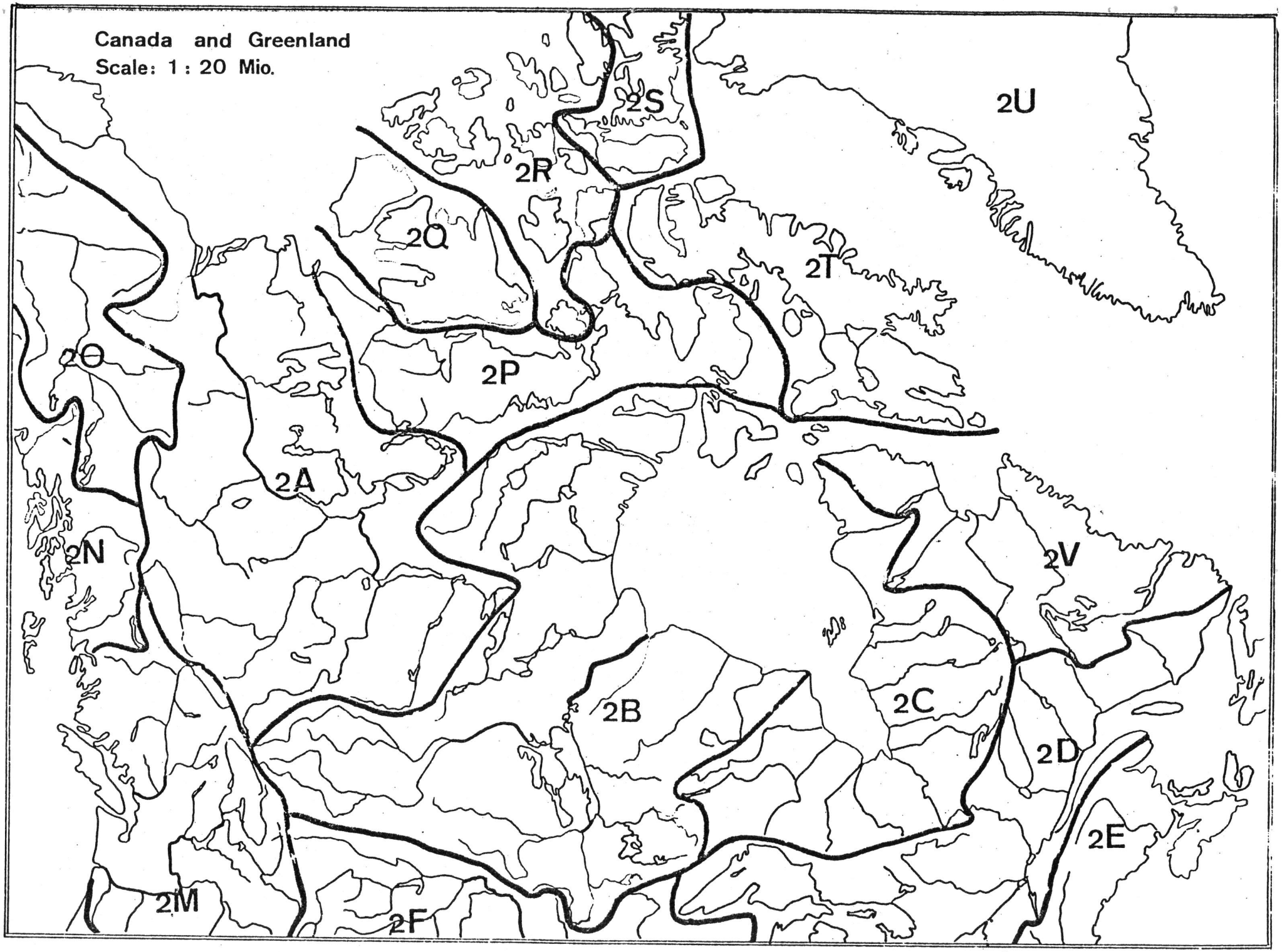
AF	*Afghanistan*
AD	*Andorra*
RA	*Argentina*
AU	*Australia*
A	*Austria*
BH	*Bhutan*
RB	*Bolivia*
BG	*Bulgaria*
BR	*Burma*
CD	*Canada*
RC	*Chile*
CN	*China*
CO	*Colombia*
CS	*Czechoslovakian Soc. Rep.*
DK	*Denmark*
EC	*Ecuador*
F	*France*
D	*Federal Rep. of Germany*
IS	*Iceland*
IN	*India*
RI	*Indonesia*
IR	*Iran*
IQ	*Iraq*
I	*Italy*
J	*Japan*
KN	*Kenya*
RL	*Lebanon*
MX	*Mexico*
MG	*Mongolian Peoples Republic*
MA	*Morocco*
NP	*Nepal*
NZ	*New Zealand*
N	*Norway*
PK	*Pakistan*
PP	*Papua New Guinea*
PE	*Peru*
PL	*Poland*
SI	*Sikkim*
E	*Spain*
S	*Sweden*
CH	*Switzerland*
TZ	*Tanzania*
TR	*Turkey*
UG	*Uganda*
SU	*Union of Soviet Soc. Republics*
US	*United States of America*
VZ	*Venezuela*
YU	*Yugoslavia*
ZR	*Zaire*

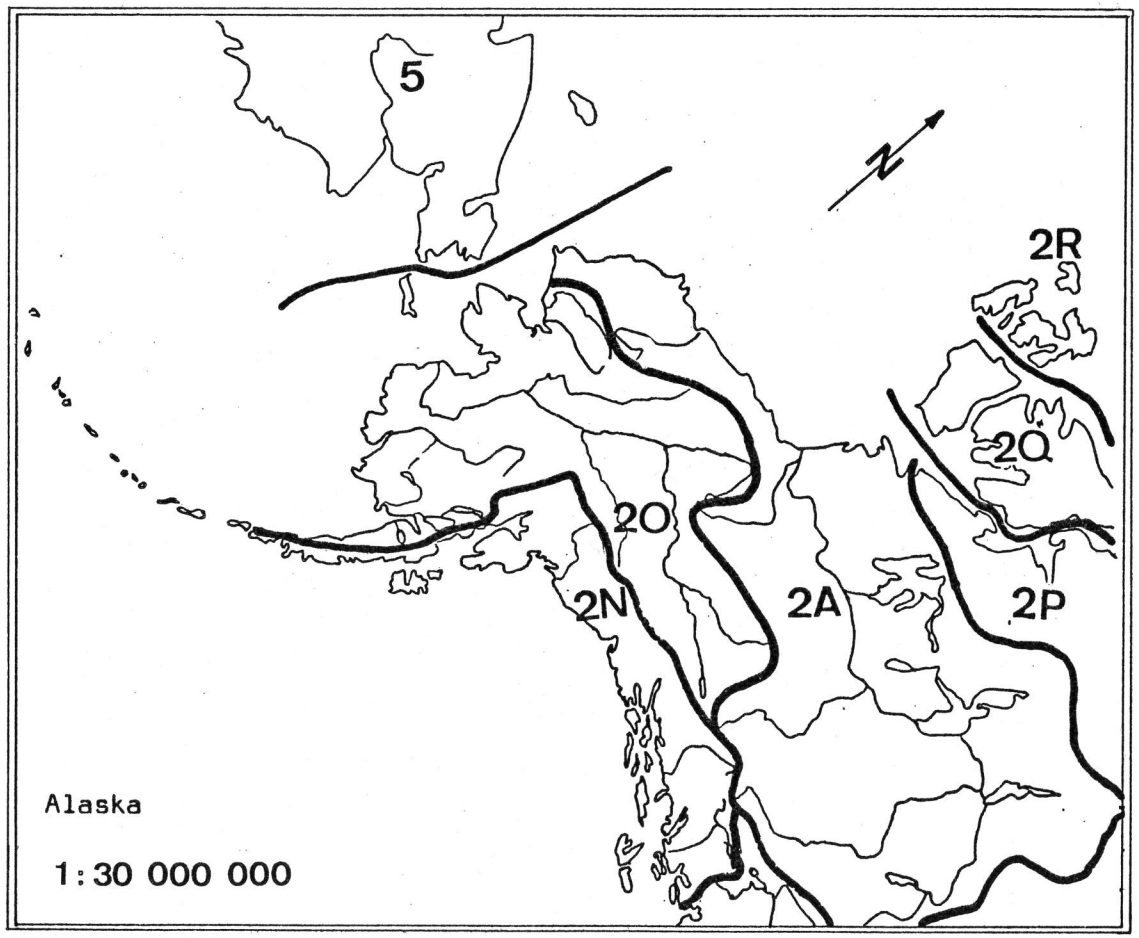

South America,
Northern part
Scale 1 : 20 Mio.
1A
1B
1C
1D
1E
1F
1O
1P
1Q

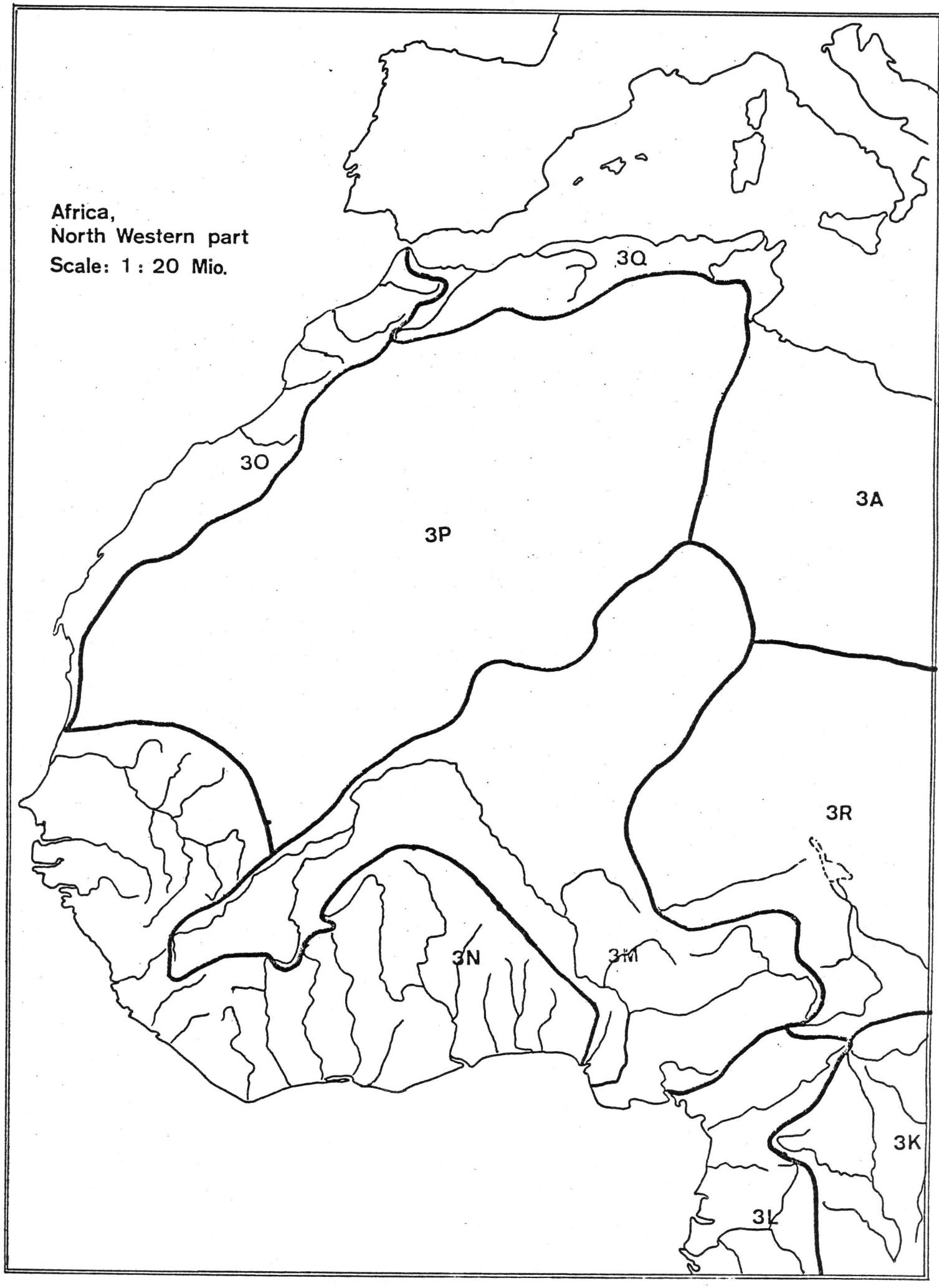


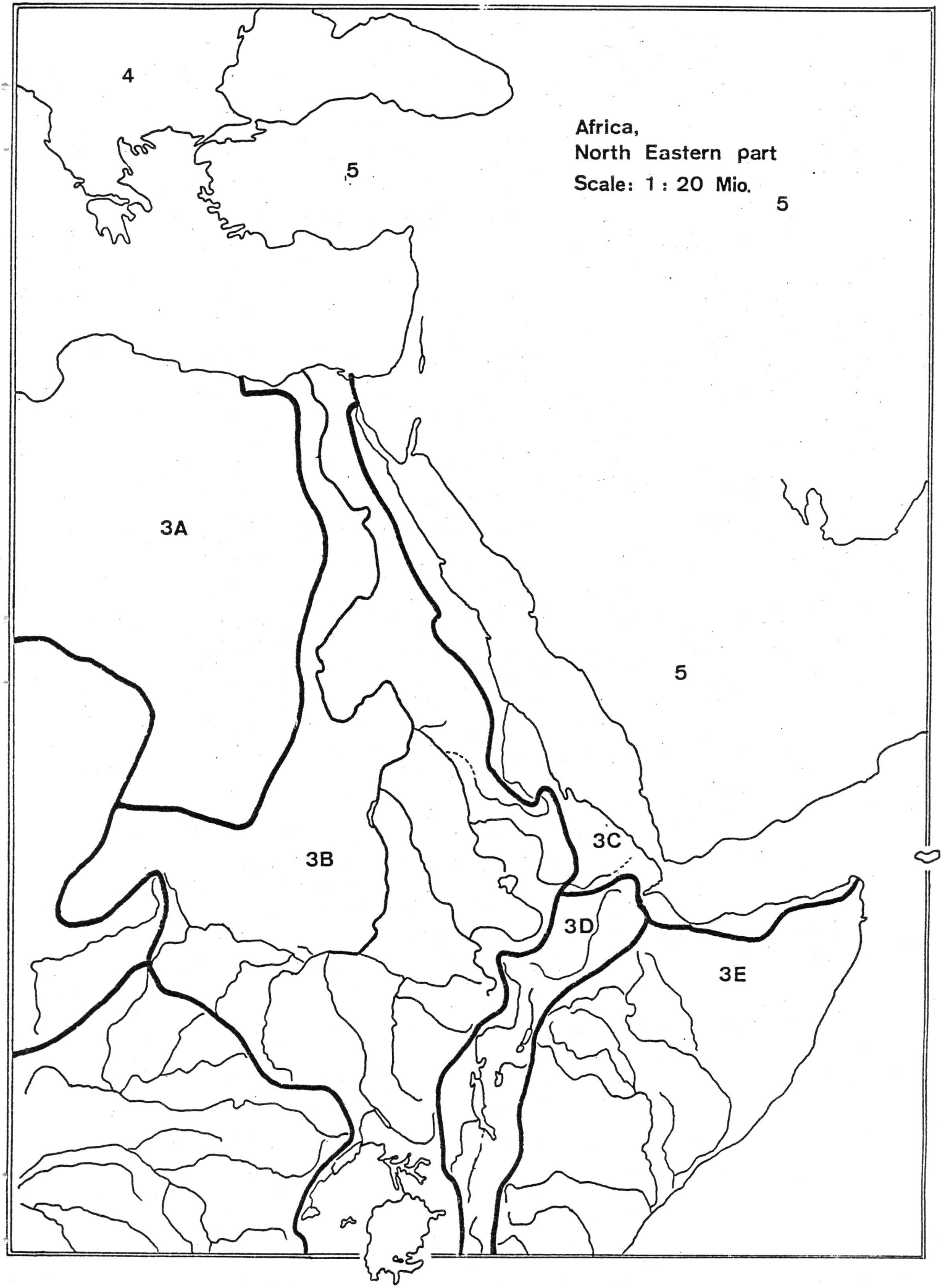
South America,
Southern part
Scale: 1 : 20 Mio.

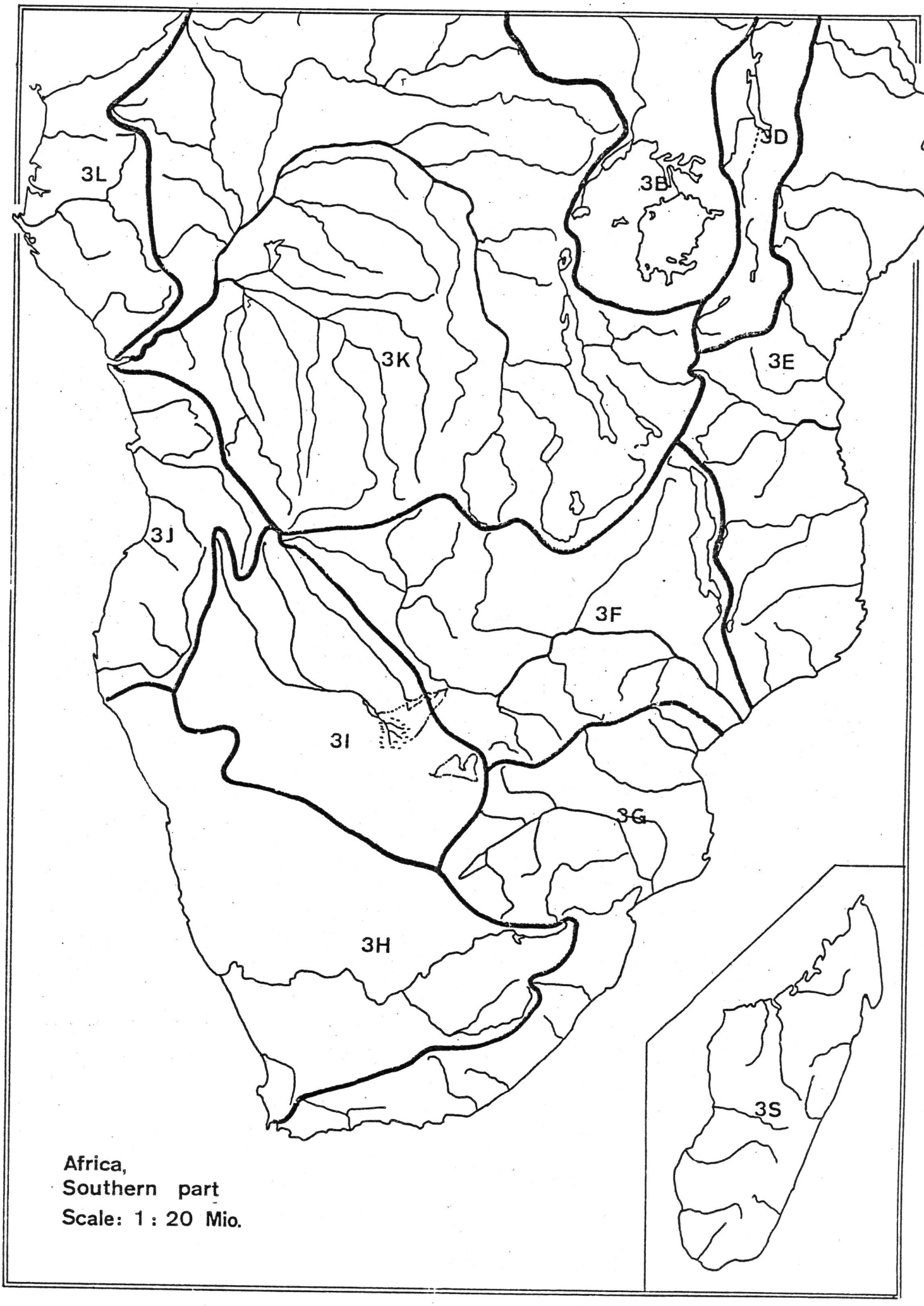

2D
2E
2L
2K
2F
2J
2G
2W
2H
2I
U.S.A., Mexico and
Central America
Scale: 1 : 20 Mio.


Canada and Greenland
Scale: 1 : 20 Mio.
2S
2U
2R
2Q
2T
2O
2P
2A
2N
2V
2B
2C
2D
2E
2M
2F

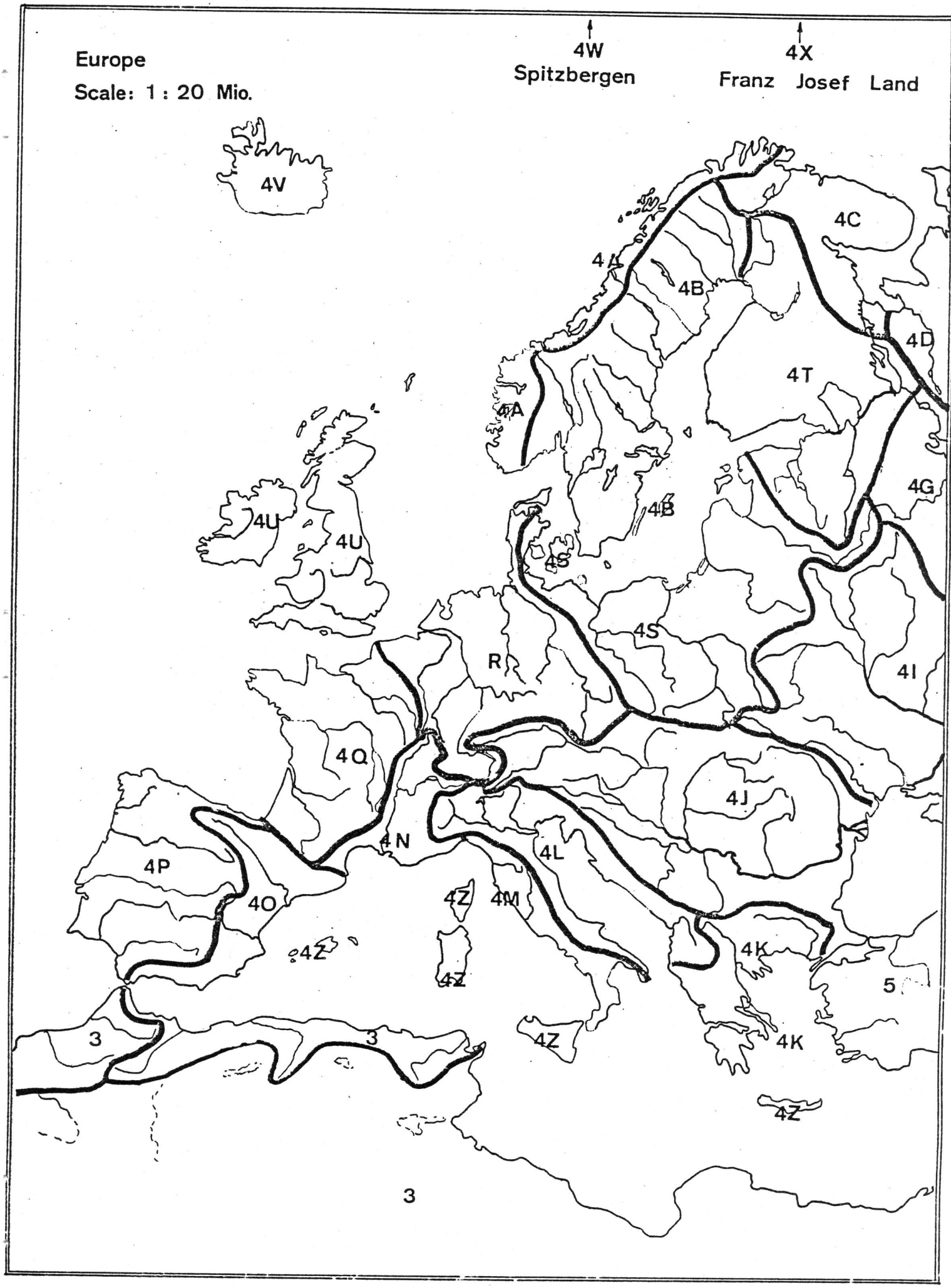

5
N
2R
2Q
2O
2N
2A
2P
Alaska
1:30 000 000

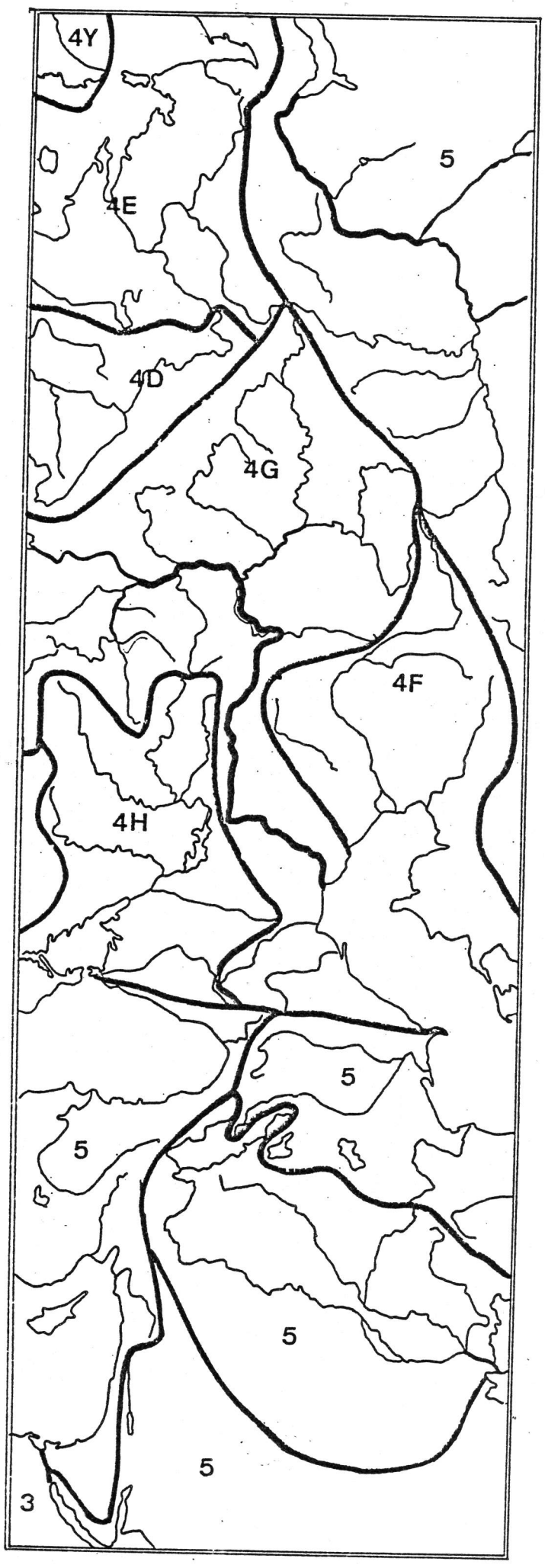

Africa,
North Western part
Scale: 1 : 20 Mio.
3Q
3O
3A
3P
3R
3N
3M
3K
3L


4
5
Africa,
North Eastern part
Scale: 1 : 20 Mio.
5
3A
5
3B
3C
3D
3E

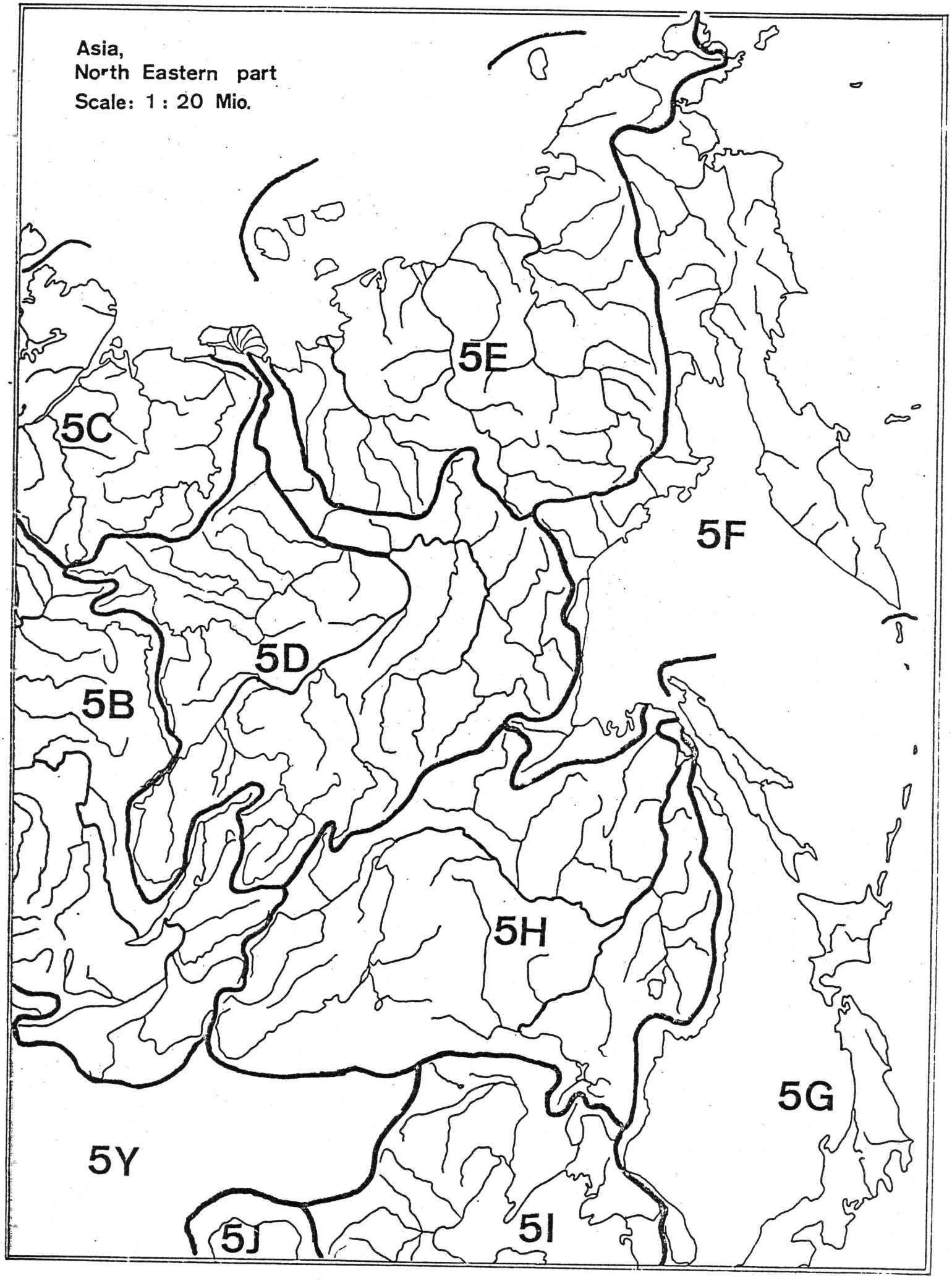


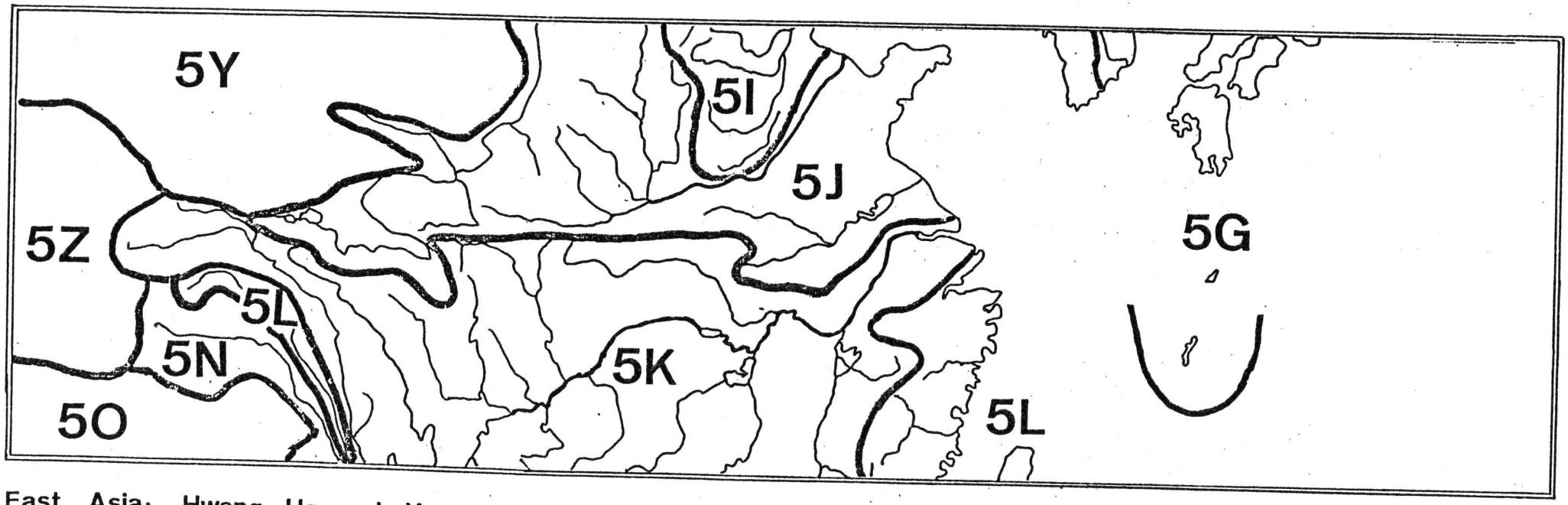
Africa,
Southern part
Scale: 1 : 20 Mio.


Europe
Scale: 1 : 20 Mio.
4W
Spitzbergen
4X
Franz Josef Land
4V
4C
4A
4B
4D
4T
4G
4U
4U
4S
4S
R
4I
4Q
4J
4N
4L
4P
4O
4Z
4M
4K
4Z
5
3
3
4Z
4K
4Z
3



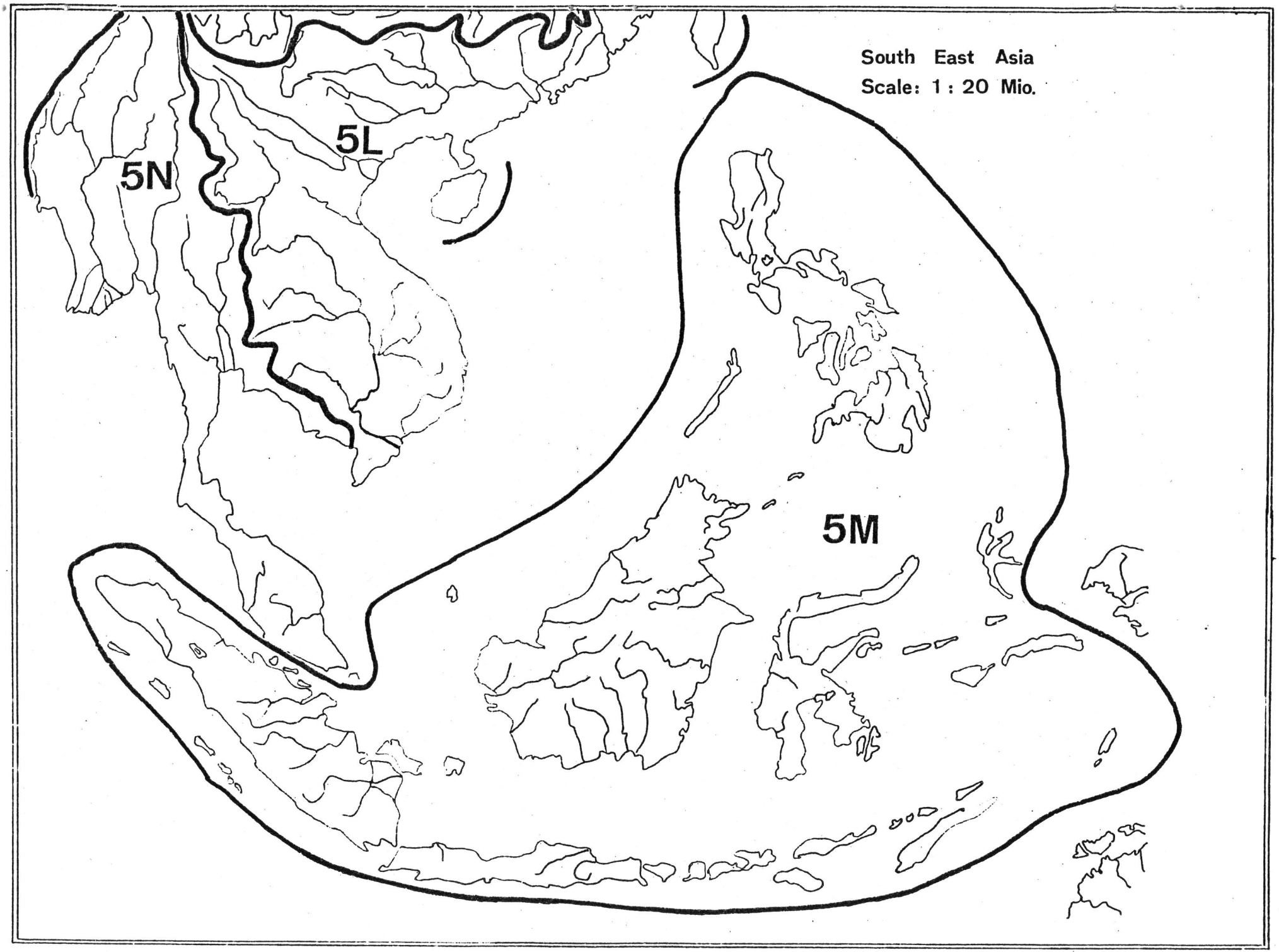
Eastern Russia
Scale: 1 : 20 Mio.

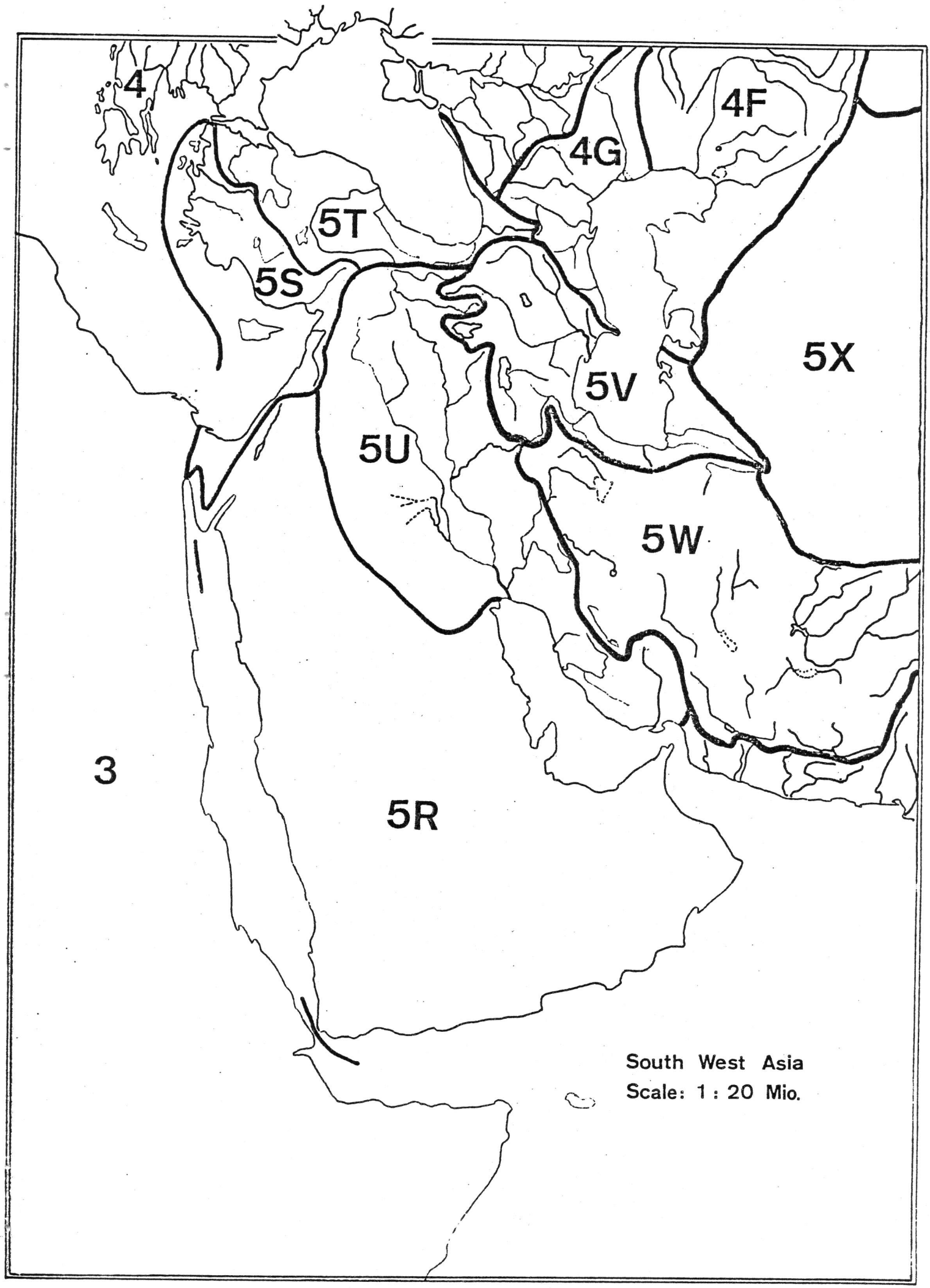

Asia,
North Eastern part
Scale: 1 : 20 Mio.
5E
5C
5F
5D
5B
5H
5G
5Y
5J
5I



East Asia: Hwang Ho and Yangtze Kiang region

Scale: 1 : 20 Mio.


South East Asia
Scale: 1 : 20 Mio.
5N
5L
5M


4
4F
4G
5T
5S
5X
5V
5U
5W
3
5R
South West Asia
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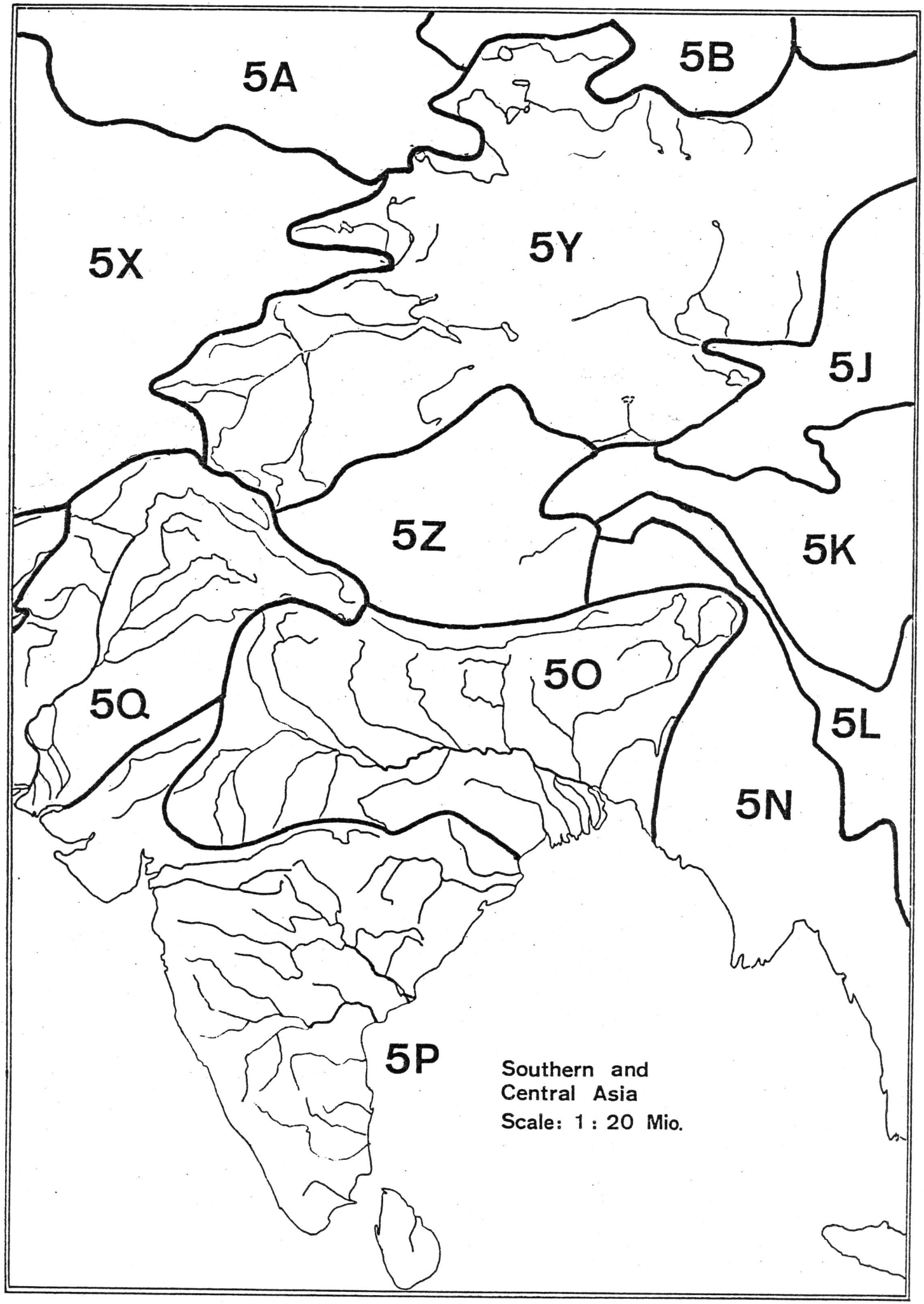
5A
5B
5X
5Y
5J
5Z
5K
5O
5Q
5L
5N
5P
Southern and
Central Asia
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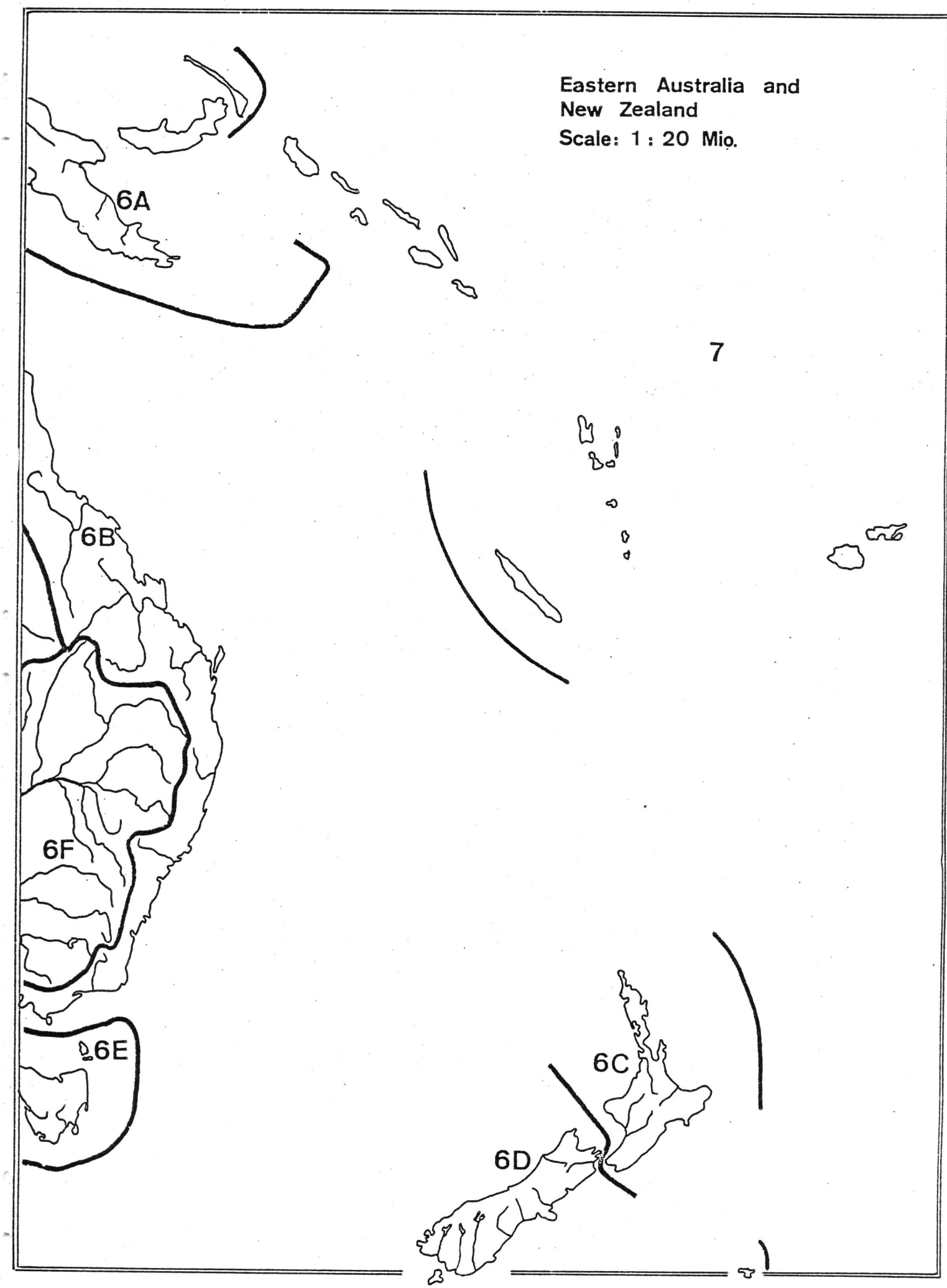
Eastern Australia and
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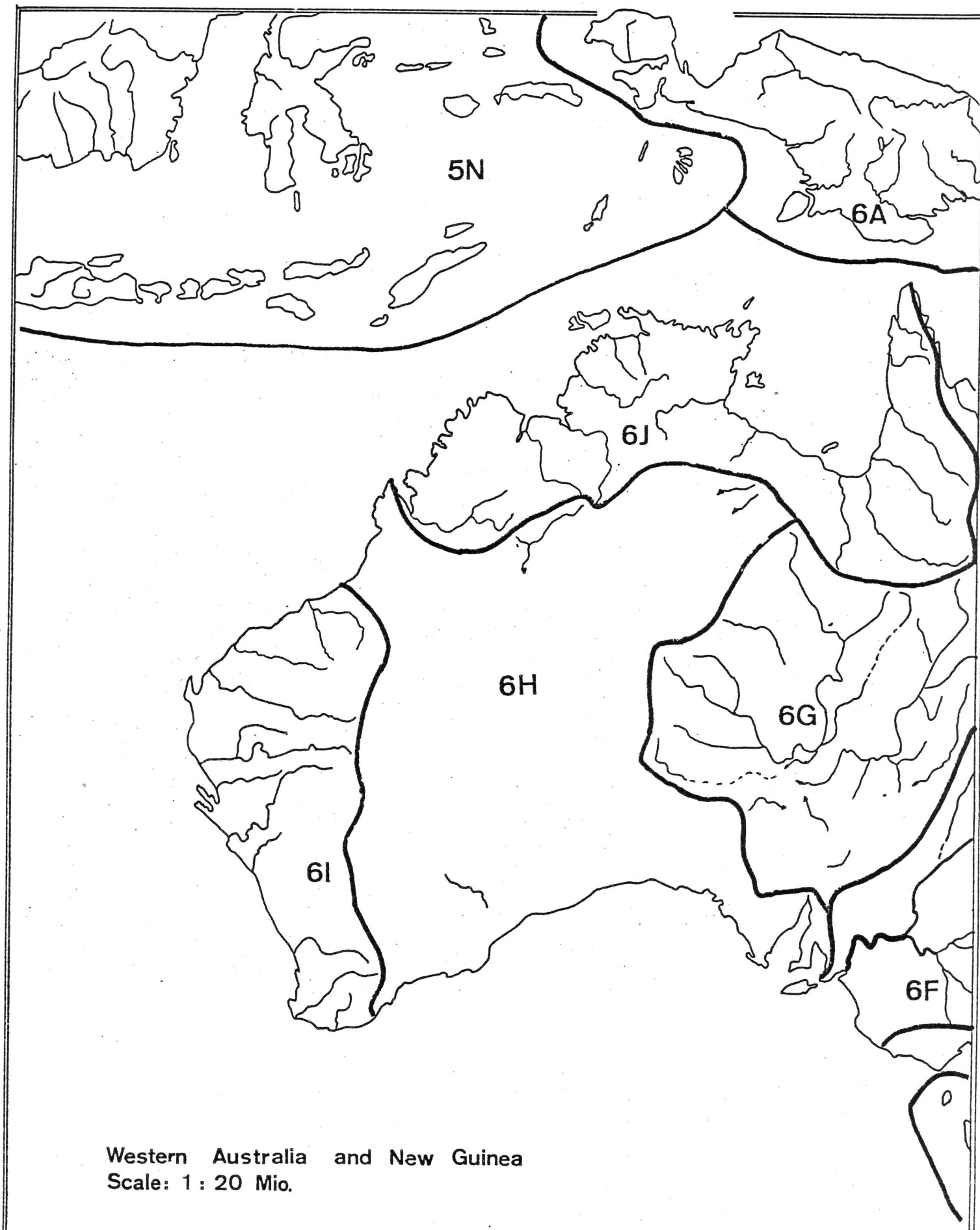
Scale: 1 : 20 Mio.
6A
7
6B
6F
6E
6C
6D



Western Australia and New Guinea
Scale: 1 : 20 Mio.