Towards a megalopolitan world?

"The title of the present essay calls to mind its triple *raison d'être:* a homage paid to the person and to the paramount contribution of the late Professor Jean Gottmann and especially to the study of the North East corridor of the United States of America coined by him as 'Megalopolis' ... Similar concerns of urban concentration emerged in the Delta of the Rhine-Scheldt-Meuse of North West Europe, more congested in space but divided by national borders of five States ... handicapping large-scale actions required by the transfrontier character of most planning issues ... and the setting-up (1955) of an international association called the Conference of Regions of North West Europe in order to cope with planning issues. The above two 'megalopolitan' areas were studied on a comparative approach in my paper 'Vers une Mégalopolis européenne?' Thirty years later it seemed to be appropriate to paraphrase the same issue in a larger context, still keeping the question mark in the title."

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Preface

The title of the present essay calls to mind its triple *raison d'être:*

- A homage paid to the person and to the paramount contribution of the late Professor Jean Gottmann and especially to his study of the North East corridor of the United States of America coined by him as "Megalopolis." We had the privilege to discuss with him in Paris, Oxford, and during his short visit to Bruges in the late 1960s at the College of Europe; his work inspired us to further studies on the matter.
- Similar concerns of urban concentration emerged in the Delta of the Rhine-Scheldt-Meuse of North West Europe, more congested in space but divided by national borders of five States – Belgium, France, Germany, Luxembourg and the Netherlands – handicapping large-scale actions required by the transfrontier character of most planning issues (e.g. green areas, transportation networks and services, transborder commuters, etc.). The starting process of European integration was limited to the Coal and Steel Community (1953) and those responsible for the physical planning of the above five countries set up (1955) an international association called the Conference of Regions of North West Europe (CRENO/CRONWE) in order to cope with planning issues (LEY, 1967) as indicated in figure 1.
- The above two "megalopolitan" areas were studied on a comparative approach in my paper "Vers une Mégalopolis européenne?" (1971) (fig. 2). Thirty years later it seemed to be appropriate to paraphrase the same issue in a larger context, still keeping the question mark in the title ...

Caveat

Definitions

The terms Megalopolis, Megalopolitan, derived from the ancient Greek "Megalos" (big) and "Polis" (town) – a municipality and an eparchia called Megalopolis still exist in Greece today in Nomos Arcadias (Peloponnese) but far under the statistical criterion used here – received after Gottmann's work a widespsread scientific echo (e.g. JAPAN CENTER, 1973; von MALCHUS, 1975; MUSCARA, 1978).

In the Ekistic Grid Index, used constantly in all issues of the journal *Ekistics,* "Small megalopolis" is listed under unit 11 (25 million inhabitants) and "Megalopolis" under unit 12 (150 million inhabitants) and recent triple issues (vol. 63, Jan.-June 1996, "Metropolis"; vol. 65, Jan.-June, 1998, "Mega-cities" and "Mega-city regions"; vol. 66, Jan.-June 1999, "Futures") offer an outstanding overview on the matter.

Hence, instead of presenting new definitions, just "l'art pour l'art," it seems advisable to retain that of J. Gottmann, in his slightly completed version of B.J.L. Berry (BERRY, 1973):

> ..., that megalopolis be identified as a tightly-woven concentration of not less than 25 million people living and working at high density in a polynuclear structure, tied together by a large volume of transactional activities.

This definition allows a series of levels within a "Megalopolitan area" as we have already done (KORMOSS, 1971):

"Level 1: North-West Europe delineated by the cardinal points Liverpool-Hamburg-Swiss Plateau-Southampton: 133 million inhabitants, 283 inh./sq.km;

Level 2: North-West continental Europe delineated by Calais-IJmuiden-Hannover-Bregenz-Geneva-Verdun: 71.7 million inhabitants, 270 inh./sq.km;

Level 3: North-East Delta Megalopolis delineated by Calais-Ijmuiden-Hannover-Bonn-Arras: 38.4 million inhabitants,[1] 462 inh./sq.km

Level 4: Metropolitan regions > 5 million inhabitants, e.g. Randstad Holland, Rhein-Ruhr, Paris agglomeration, Greater London;

Level 5: Metropolitan regions between 2.0 and 4.5 million inhabitants, e.g. Randstad, North wing, Randstad, South wing, Antwerp-Mechelen-Brussels, Rhein-Main, Greater Birmingham, Greater Manchester;

Level 6: Agglomerations and urban regions between 0.8 et 2.0 million inhabitants, e.g. the triangle Aachen-Liège-Maastricht, Rhein-Neckar, Lille-Roubaix-Kortrijk."

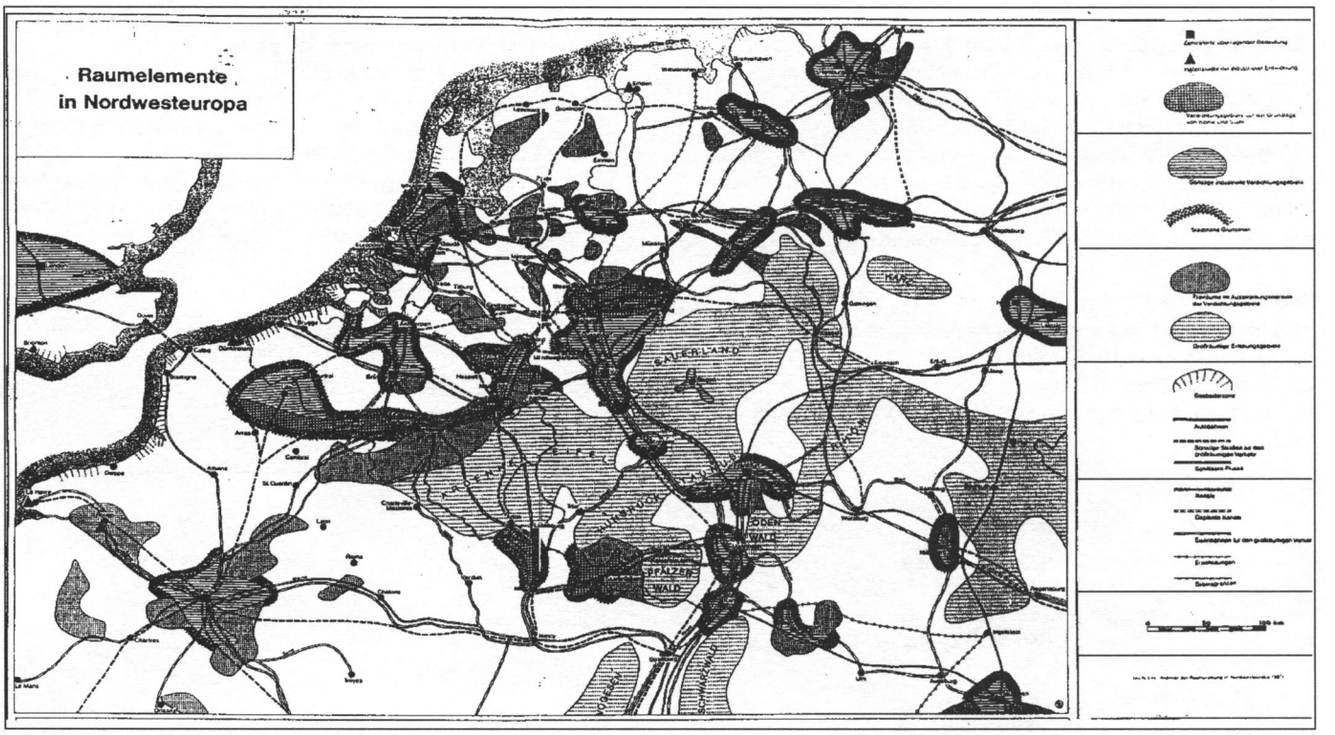

Fig. 1: Space elements in North West Europe. *(Source:* Ley, in *Wegwijzers,* 1967).

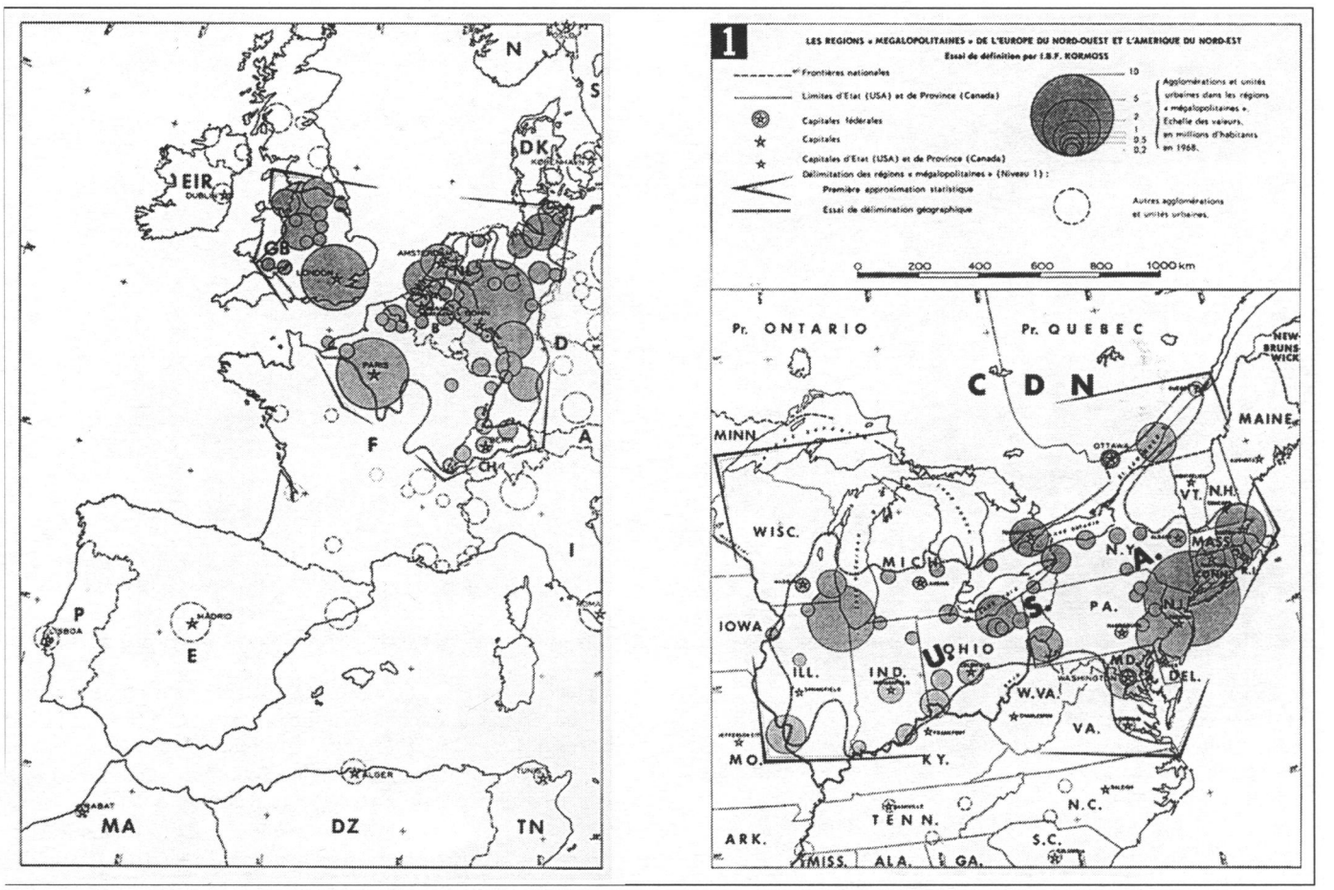

Fig. 2: Megalopolitan regions of North West Europe and North East America. *(Source:* Kormoss, 1971).

Levels 1, 2, 3 are definitely *transborder areas,* those of levels 4 to 6 intermunicipal and partly interprovincial (or *Länder*), partly international transborder areas as is the North-American level 1 we defined in 1971 between Quebec-Boston-Norfolk-Saint Louis-Duluth (108 million inhabitants, 107 inh./sq.km).

The delineation of other areas – outside the North Atlantic Megalopolitan 1 area – should be examined under double facets: the interior population and socio-economic structures and the exterior setting and relationships.

Statistics

The statement *Die Zahlen regieren die Welt* (Figures govern the world) attributed to Goethe (1749-1832) is often quoted in statistical handbooks. Still there is little or no evidence that this universal genius dealt with statistics: he was a minister of finances of Thüringen in charge of budget figures.

Arnold Toynbee's (1894) remark on "our imperfect materials"

> "Coming to the facts of the Industrial Revolution the first thing that strikes us is the far greater rapidity which marks the growth of population. Before 1751 the largest decennial increase, so far as we can calculate from our imperfect materials, was 3 percent."

is still striking for scholars of the 21st century that is beginning, frustrated by delayed or cancelled censuses in highly developed countries,[2] in category "A" of the UN statistics and there are three other ranks at worldwide scale ...

Moreover, the ongoing censuses – if any – (2000, 2001) are not yet available with detailed (local units) breakdown and comparable population and socio-economic data – notwithstanding the electronic devices, not available for Toynbee!

Therefore, regretfully but not surprisingly, our statistical series end – with a few exceptions – by the 1990s with retrospective data back to the 1950s and if feasible the 1900s.

Methods

The methods of the present study flow out logically from the above definition and statistical issues and they are:

- historical (retrospective), and
- comparative (selective).

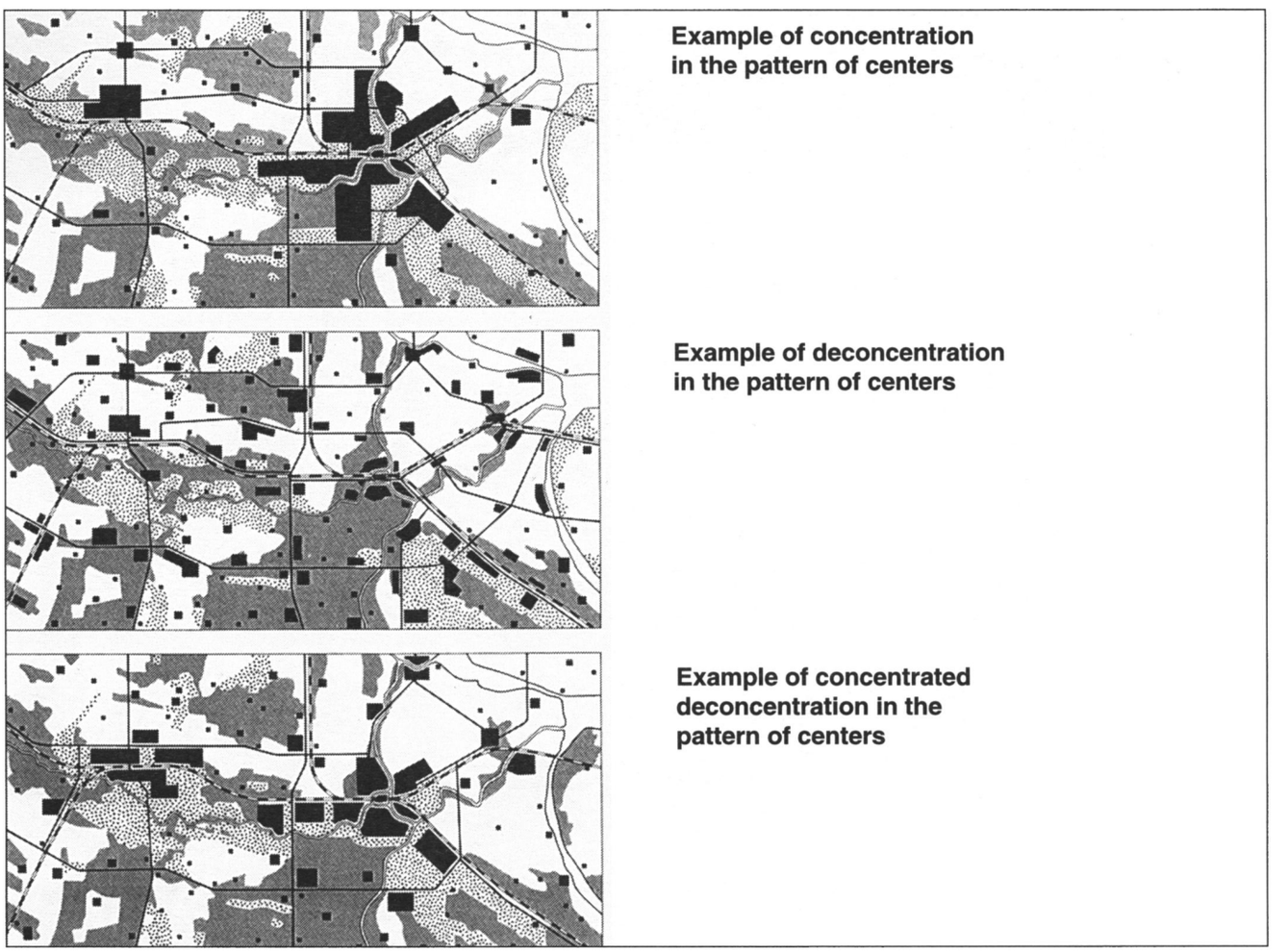

Fig. 3: Three alternatives for the future urbanization pattern. *(Source: Second report on Physical Planning in the Netherlands,* The Hague, 1966).

Historical: Urbanization is a long-term process where a historical approach is advisable and necessary, e.g. the so-called crater phenomenon demonstrated for North West Europe (KORMOSS, 1961): the "flight" to the suburban (green) area was a hard trend (*tendance lourde)* during a generation after World War II and just moderately ebbed after the 1973 petroleum crisis. Cfr. also for Lombardy/Milan (PRACCHI, 1978) and about skyscrapers (GOTTMANN, 1967).

On the other hand, future apocalyptical scenarios (EHRLICH,

1968) such as depicted in *The Population Bomb* have been contradicted by the real demographic evolution and 10 years after partly rectified by the author. On the contrary, one of the most improbable scenarios for 2000 of Kahn and Wiener (1968), namely the collapse of the communist regime has occurred ... and long before that mythical date.

The year 2000 was also the horizon for planning perspectives in the well known "Second report on physical planning in the Netherlands" (1966), a pioneer step in the form (published in four languages – German, English, French, Dutch – by a national agency), in the geographic delineation (all the maps in the appendix cover areas beyond the Dutch border, especially Map 2, "Spatial structure of the Netherlands in a larger surrounding" depicting North West Europe between Liverpool-Hamburg-Mannheim-Cherbourg) and in the proposed urban pattern, i.e. the "concentrated deconcentration" (more expressive in Dutch: *gebundelde deconcentratie)* (fig. 3).

Despite all expertise and interdisciplinary effort, the 1966 Dutch scenario

> "It is to be expected that between now and 2000 our population will increase by about 7.5 million people"[3]

failed, the population figure in 2000 was 15 million: the events in May 1968 in Paris and their demographic consequences were not predictable – nor were those of September 11 in New York and their influence on urban planning, which are still coming.

Comparative: Historical comparison should be completed by a geographical one, leading to a selection of megalopolitan areas spread out on the Earth outside the negative areas as delineated by Stamp (1952), (fig. 4) – less often quoted than its importance would require – a "global" approach, *avant la lettre* and emphasized by Lewis Mumford (1961/1967):

> "Now it is not a river valley, but the whole planet that must be brought under human control ..."

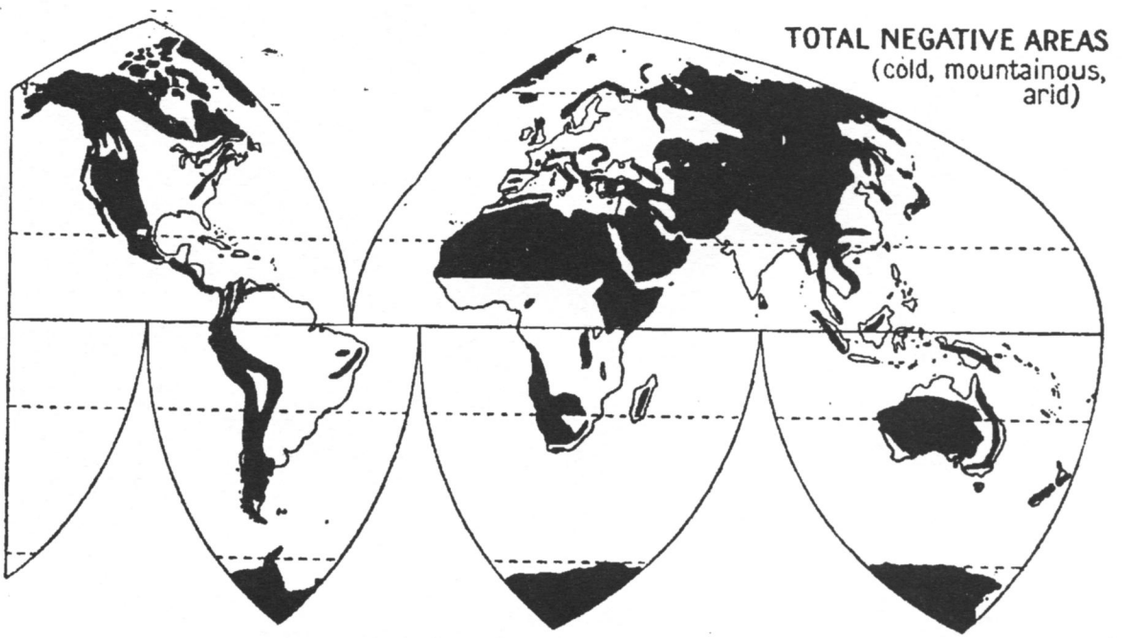

Fig. 19. The map combines Figures 16, 17, and 18 and shows those parts of the earth's surface which through cold, aridity, or mountainous character prohibit close settlement and agricultural development. It does not take account of irrigation settlements where the 'negative' character of the land has been counteracted, notably in Egypt, Iraq, north-western India and western Pakistan, Russian Central Asia, and parts of western United States.

The blank areas which remain on this map are potentially cultivable or actually cultivated. Although so much of the earth's surface has been eliminated, many areas have been given the benefit of the doubt in deciding whether or not they are 'cultivable': thus, the high plateau of Bolivia, a considerable part of the Canadian Shield, Finland, and the Russian forest lands are included.

The map serves to focus attention on the 'positive' or presumably developable areas of South America and Africa as the major under-developed lands, and calls attention to comparable problems of Canada and U.S.S.R. in northward expansion.

Fig. 4: The World Lands: Total negative areas. *(Source:* Stamp, 1952).

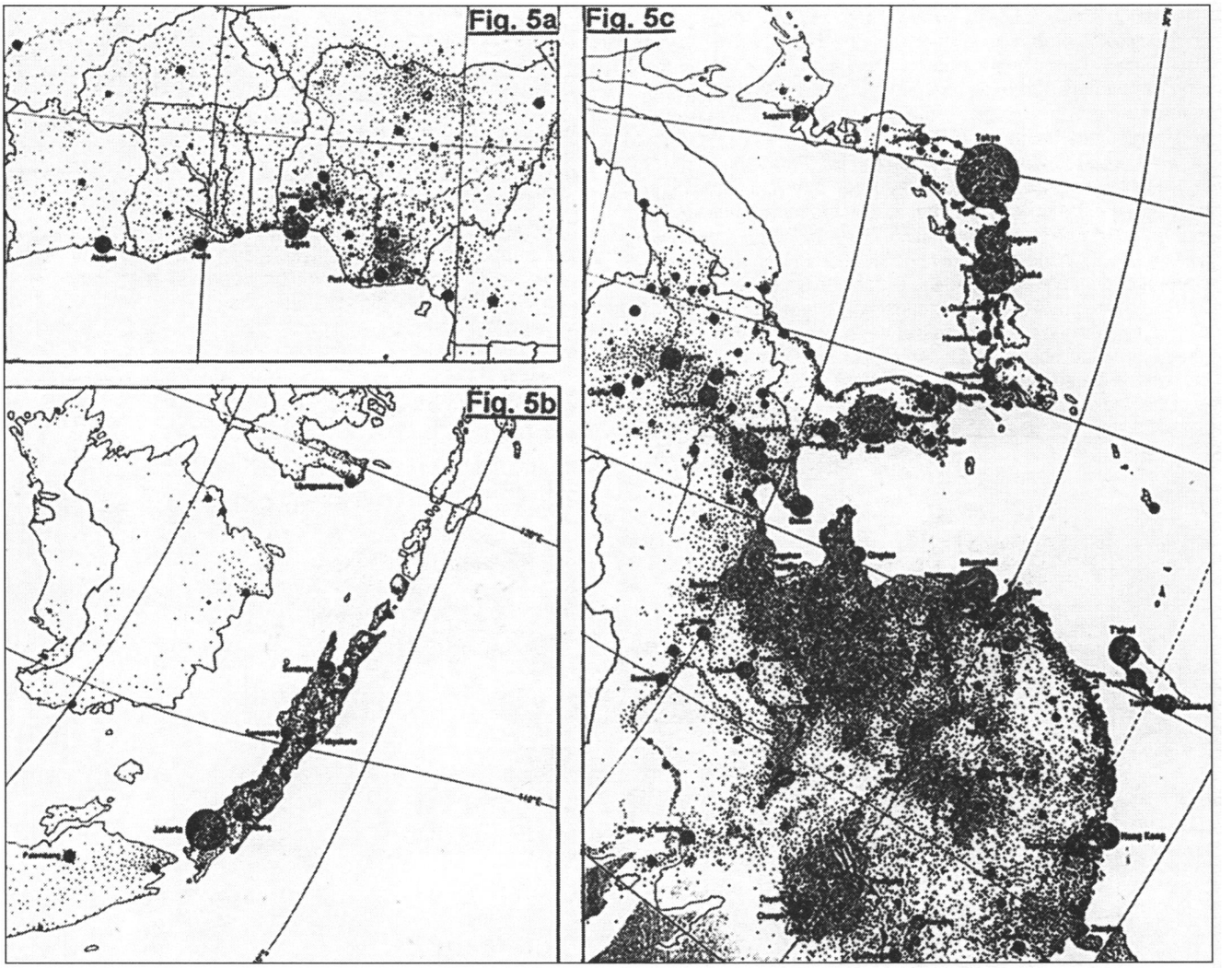

Fig. 5: Excerpts from *Distribution of the World's Population. (Source:* UNESCO, 1997).

Indeed, megalopolitan areas are distributed on the *whole planet* located in clearly defined *positive* regions:

- sometimes isolated in both the geographical (insular location) and demographic sense (surrounded by very low densities) as in Java-Bali vs. Borneo and Sumatra (fig. 5b); or,
- articulated in axial population belts at the edge of deserts such as between Abidjan-Accra-Lagos-Douala-Yaoundé (fig. 5a); or,
- forming huge coastal/peninsular/insular concentrations with deep continental hinterland as Manchuria/South Primorsk with Vladivostok/North and South Korea/Japan/Taiwan/ Continental China of the Great Rivers (fig. 5c) (cf. LEMAN, 1998).

In order to complete our first study (1971) we recently drafted (KORMOSS, 1999) a comparative map for N.E. American/N.E. Central European/Far East megalopolitan areas visualizing urban units with more than 500,000 inhabitants (fig. 6). More detailed studies as in Europe, based on municipalities (nearly 100,000 in EUR 15!) or in N.E. American countries could not be carried out for the Far East, except for Japan, for the above-mentioned reasons: (i) definition, (ii) statistics.

The following will therefore deal more in detail with the megalopolitan areas around the North Atlantic area and with the Japanese archipelago, keeping eyes open on the other megalopolitan areas in formation or *in spe.*

Megalopolitan areas study

The issues discussed are:

- the delineation of the "field of comprehensive study" (as TOYNBEE, 1894 stated), i.e. here geographical, historical and statistical framework;
- population evolution and density of the concerned countries;
- demographic indicators for the selected megalopolitan areas; and,
- megalopolitan areas in global world network perspective.

Delineation of the study area

In our first above-mentioned study (1971) the delineation of the three megalopolitan areas of the developed (OECD) world was proposed as being located between the following foci:

- **North West Europe:** Liverpool-Hamburg-Swiss Plateau-Southampton
- **North East America**: Quebec-Boston-Norfolk-Saint Louis-Duluth
  and adapted to major administrative subdivisions.
- For **Japan,** reference was made to the entire country area or to the central main island (Honshu = Hondo).

As all delineations of divisions of a whole, the above proposals might be questionable from several viewpoints, e.g. such as:

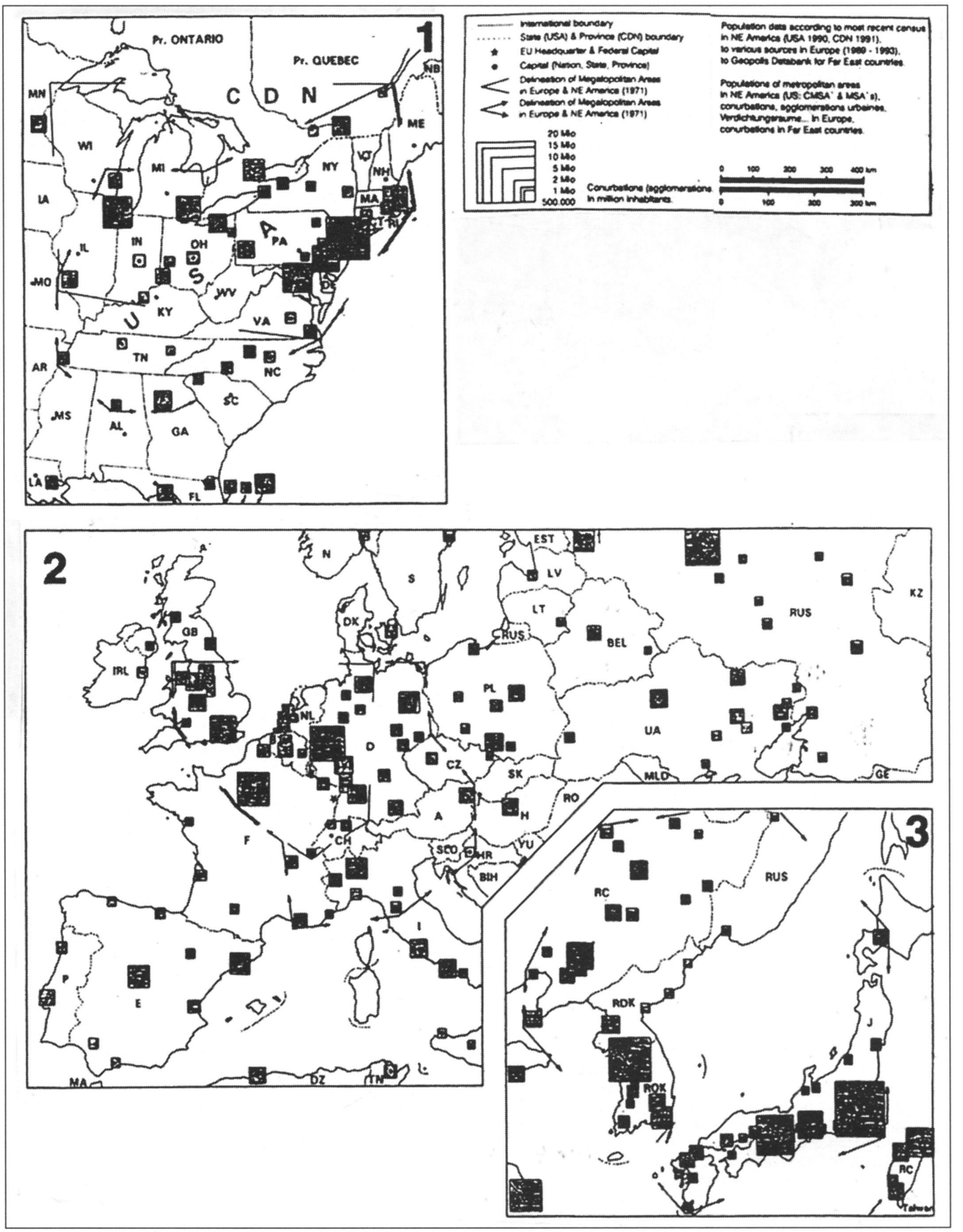

Fig. 6: Megalopolitan areas in NE America, NW and Central Europe and Far East. *(Source:* Kormoss, 1999).

• **The pertinence of the basic criterion** chosen: here the advanced level of Megapolitan urban pattern as defined by Gottmann/Berry.
• the **choice** of the most appropriate **statistical/administrative units**:
- in Europe: province, département, county, Regierungsbezirk, canton;
- in America: the State or province respectively, county;
- in Japan: the division in islands.

• The understandable **chronological limit** for the historical "flashbacks." Here we hoped to be able to bridge over two centuries. If data were available for the U.S. from the first census in 1790, this was not the case for all regions of the N.W. European Megalopolis, mainly due to changing areas of States and their regional units. So our historical series start after the Congress of Vienna (1815). Also, in order to facilitate long-term comparisons, in Germany we followed the retrospective data of the Statistical Bundesamt from 1816 to 1996 for the area of West Germany (1950-1989: 248,938 sq.km, cf. *Statistisches Jahrbuch 1997,* p. 47) completing that series with data since 1939 for united Germany (1989: 357,022 sq.km).

In order to make in historical series the delineation of the territorial units *similar* on both sides of the Atlantic as far as constituting the megalopolitan areas, we adopted:
• in Europe, the level of *Länder,* British and French regions and Swiss cantons outside of Benelux, belonging entirely to the N.W. Megalopolis;
• in America, the U.S. States (18 until 1840, 19 with Wisconsin from 1840 on) and a special delineation in the Canadian provinces Ontario and Quebec, for the southern densely populated parts, dealt with in **Appendix 1**.

As for Japan there is no other choice than those imposed by geography; going below to level of prefectures is helpful and necessary for a better definition of conurbations, but not for the delineation of the megalopolitan area, as we adopted, covering the entire country (370,285 sq.km). No data are available prior to the year 1870.

• Finally, political constraints could not be neglected, e.g. the border barriers known as the "iron curtain," a geographical nonsense, deleted from the map of Europe in 1989 but rendering, in the period of the publication of our first study, Lübeck, Hamburg, Wolfsburg, Kassel, Fulda, etc., frontier towns within an earlier united socio-economic landscape.

With the fall of the Berlin Wall, the delineation of the N.W. Megalopolis is likely to be moved to the East, possibly up to Rostock, Dresden, Chemnitz, and the name perhaps changed into ... the North-Central European urbanized milky-way?

For the above indicated historical period (1820-1990) a few basic comparative indications were chosen, i.e.
• population
• population density covering both historical and geographic aspects of demographic patterns; and,
• increase or decrease over preceding census (normally 10 years).

This approach needs two steps:

• **The first step:** A general framework of data *on country level:* USA, Canada, Japan as well, for Europe, the seven countries covered (entirely or partly) by the N.W. Megalopolis and, for further comparison, Finland, Sweden and "Hibernia," i.e. *the whole island* of Ireland (divided since 1922 into two parts: Republic of Ireland and Northern Ireland, belonging to the UK); we use these data for historical and statistical reasons.

Also, this will allow us to realize that Benelux – currently the core area of the N.W. European Megalopolis – and Hibernia were characterized in the first half of the 19th century by very similar indicators (same number of inhabitants, nearly the same population density in similar areas) and that without the potato blight, the worst demographic incident in modern Europe, Hibernia would probably have had the chance of another destiny.

For these reasons and for easier reading, the statistical data are divided into several tables: table 1 registering the number of inhabitants of the above selected countries, table 2 dealing with their population density and table 3 indicating intercensal change (increase or decrease) of population.

• **The second step** (table 4) deals with the same data of the above delineated three megalopolitan areas – Japan being present in both steps for a better comparison.

For the location of the three areas dealt with, one should refer to figure 6.

Population evolution and density of selected countries

Population evolution: As a first approach in all international statistics (UN, EUROSTAT, OECD, Council of Europe), records on the number of inhabitants are most helpful, although these figures are seldom available for the last two centuries. Official census data are used if available; if not or when other reservations – e.g. data for census years – have to be made, figures are printed in italics.

Table 1 deals with straight (population) figures in thousands; serving as basic data for elaborating further indicators such as density and intercensal population change.

Population density of selected countries: Data on population densities could be divided into three groups as far as historical evolution concerns:
• countries or regions with high density, such as Benelux, Great Britain, Germany and Japan;
• countries with low density, such as North European countries, USA (and Canada, cfr. Appendix 1 and selected figures in footnote of **table 2**); and,
• countries with medium density, such as France, Switzerland and Hibernia, the last one having reached the threshold of 100 inhabitants per sq.km earlier (1840) than all other countries of our study, but having dramatically diminished in the second half of the 19th century and slowly recovering since the 1950s.

It should be stressed that the above figures are national averages, useful for a first approach, but covering a wide range of regional differences.

At the above threshold (100 inhabitants per sq.km) arrived successively, still in the 19th century, Benelux (1850), Great Britain (1860), Japan (1880), Western Germany (11 *Länder*) (1890), much later Switzerland (1930) and just in the latest census period France (1990).

Not belonging to the N.W. European Megalopolitan area, the figures for Sweden and Finland are helpful as a comparison with those of USA and Canada.

According to the latest trends, three groups of countries are emerging:
• Benelux and Japan, on the top, with 344 and 334 inh./sq.km respectively with roughly – but surprisingly – similar growth trends since 1870;
• Federal Republic of Germany (BRD) and Britain, close together (257 and 247 respectively) with criss-crossing trends: BRD first (1800) leading but rapidly (1820) overtaken by (industrial) Britain and retaking the lead since the 1960s;
• France forms a category apart due to a century-long demographic stagnation until the very impressive baby boom after World War II.

The above stressed population density trends over nearly two centuries are confirmed by the figures (percent) of population

Table 1
Population evolution for selected countries (1,000 inhabitants)

Year	Benelux	F	GB	BRD	Hibernia	CH	S	FIN	USA	JAP
1790	–				4,753	–	2,188	706	3,929	–
1800	*5,086*	27,349	10,501		...	–	2,347	833	5,308	–
1810	...	*29,107*	11,970	*13,720*	...	–	2,396	863	7,240	–
1820	*6,350*	*30,462*	14,092	14,580	6,802	–	2,585	1,178	9,636	–
1830	*6,860*	32,569	16,261	15,860	7,767	–	2,888	1,372	12,866	–
1840	...	34,230	18,534	17,010	8,175	*2,190*	3,139	1,446	17,069	–
1850	7,580	35,783	20,817	18,230	6,552	*2,393*	3,471	1,637	23,192	–
1860	8,028	37,368	23,128	19,050	5,799	*2,507*	3,860	1,747	31,443	–
1870	8,608	36,103	26,072	20,410	5,412	*2,669*	4,169	1,769	38,558	36,288
1880	9,743	37,406	29,710	22,820	5,175	*2,846*	4,566	2,061	50,189	38,166
1890	10,793	38,133	33,029	25,433	4,705	*2,933*	4,785	2,380	62,980	40,353
1900	12,034	38,461	37,000	29,838	4,459	3,315	5,137	2,656	76,212	43,785
1910	13,542	39,192	40,831	35,590	4,390	3,753	5,522	2,943	92,228	49,066
1920	14,532	38,798	42,769	*39,017*	*4,229*	3,880	5,905	3,148	106,021	55,391
1930	16,333	41,228	44,795	40,334	*4,248*	4,006	6,142	3,453	123,203	63,872
1940	...	...	...	43,008	...	4,266	6,372	3,696	132,164	71,400
1950	*18,428*	*41,315*	*48,854*	49,989	4,332	4,715	7,041	4,030	151,325	83,200
1960	21,061	46,500	51,284	55,433	4,243	5,429	7,495	4,446	179,323	93,419
1970	23,205	51,250	53,821	60,651	4,503	6,270	8,110	4,680	203,302	103,720
1980	24,464	53,966	54,784	61,538	5,007	6,366	8,320	4,812	226,542	117,060
1990	25,460	57,055	56,193	63,254	5,121	6,874	8,576	4,974	248,718	123,557
1995/6				66,444		7,065			*265,284*	

Italics: Changes for non-decennial periods, according to censuses held outside of a year ending with O or 1; other non-comparable data, except USA: Population data of census figures relating to changing territories.

Key figures for Canada (1,000 inhabitants):

1901 : 3,371	1961 : 18,238
1911 : 7,206	1971 : 21,568
1921 : 8,788	1981 : 24,343
1931 : 10,377	1991 : 27,297
1941 : 11,507	1996 : 29,123
1951 : 14,009	

Key figures for United Germany (territory of 1991) (1,000 inhabitants):

1950s : 68,377	Density : 193
1960s : 73,300	205
1970 : 77,709	218
1980 : 78,275	219
1990 : 79,365	222

Table 2
Population density (inhabitants/sq.km)

Year	Benelux	F	GB	BRD	Hibernia	CH	S	FIN	USA	JAP
1790					58	–	5.3	2.3	*1.7*	
1800	...	51	46	...	...	–	5.7	2.7	*2.3*	
1810	...	55	52	*55*	...	–	5.8	2.8	*1.7*	
1820	86	57	61	59	83	–	6.3	3.4	*2.1*	
1830	93	61	71	64	95	–	7.0	4.0	*2.9*	
1840	...	64	81	68	100	*55*	7.6	4.2	*3.8*	
1850	102	67	91	73	80	*60*	8.4	4.8	*3.1*	...
1860	108	69	101	77	71	*63*	9.4	5.1	4.1	...
1870	116	68	113	82	66	*67*	10.1	5.2	4.2	98
1880	131	71	129	92	63	*71*	11.1	6.0	5.5	103
1890	146	72	144	102	57	*73*	11.6	6.9	6.9	109
1900	162	73	161	120	54	89	12.5	7.8	8.3	118
1910	182	74	178	143	53	94	13.4	8.6	10.0	133
1920	196	71	186	*157*	...	97	14.4	9.2	11.5	150
1930	220	76	195	162	*52*	100	14.9	10.1	13.5	173
1940	...	...	...	*173*	*52*	107	15.5	10.8	14.4	193
1950	249	76	213	203	53	118	17.1	13.2	16.4	225
1960	284	85	223	223	52	136	18.2	14.6	19.5	252
1970	313	94	234	244	55	157	19.7	15.3	22.2	280
1980	330	99	238	247	61	159	22.2	15.8	24.7	316
1990	344	105	224	254	62	172	20.7	16.3	27.1	334
1995/6				*267*		*177*			*29.0*	

Due to the huge areas non-inhabited in Canada (1991: 9,203,210 sq.km land areas) the density as indicator for the whole country is less appropriate (cfr. table 4 for the Southern Megalopolitan area).

As for information: the density reaches 1.13 in 1930 (1920: 0.95) with subsequent growth: 1940: 1.25; 1950: 1.52; 1960: 1.98; 1970: 2.34; 1980: 2.65; 1990: 2.97; and 1996: 3.16 inhabitants/sq.km.

Italics: Changes for non-decennial periods, according to censuses held outside of a year ending with 0 or 1; other non-comparable data.

increase or decrease over preceding census (**table 3**) (intercensal evolution). Census data are not yet standardized overall for years ending in 0 or 1 (1980 or 1981, 1990 or 1991), as proposed by UN and EU statistical offices.

Also due to political events occurring on various dates and leading to changes of area, population number figures of some countries are only available for other years (1816, 1925, 1936).

Hence table 3 should be consulted with caution, particularly for the USA with growing territory and huge immigrant flows leading to over 35 percent intercensal growth ... by the way misleading Malthus when elaborating his statement on "doubling time" of the population in 25 years – true for the USA at the end of the 18th and beginning of the 19th centuries only.

The baby boom after World World II marks higher figures for

Table 3
Population increase/decrease over preceding census for selected countries (in percent)

Year	Benelux	F	GB	BRD	Hibernia	CH	S	FIN	USA	JAP
1790					17.4		3.3	6.3	–	
1800							7.3	16.0	35.1	
1810		*6,4*	14,0				2.1	3.6	36.4	
1820	*24.8*	*4.6*	17.7	*7.9*	*43.1*		7.9	36.5	33.1	
1830	8.0	6.9	15.4	8.8	14.2		11.7	16.5	33.5	
1840	...	5.1	14.0	7.3	5.3	–	8.7	5.4	32.7	
1850	*10.4*	4.5	12.3	7.2	-19.8	9.3	10.6	13.2	35.9*	
1860	5.9	*4.4*	11.1	4.5	-11.5	4.8	11.2	6.7	35.6	
1870	7.2	*-3.4*	12.7	7.1	-6.7	6.5	8.0	1.2	22.6*	
1880	13.2	2.8	13.9	11.8	-4.4	6.6	9.5	16.5	30.2	5.2
1890	10.7	1.9	11.1	11.5	-9.1	3.1	4.8	15.6	25.5	5.7
1900	11.5	0.8	12.0	17.3	-5.2	13.0	7.4	11.6	21.0	8.5
1910	12.5	1.9	10.4	19.2	-1.5	13.2	7.5	10.8	21.0	12.1
1920	7.3	*-1.0*	4.7	*9.6*	*-3.7*	3.4	6.9	10.3	15.0	12.9
1930	12.3	6.2	4.7	*3.4*	–	3.2	4.0	9.7	16.2	15.3
1940	...	...	...	6.3	*0.4*	6.4	3.7	6.5	7.3	11.8
1950	*12.8*	*0.2*	*9.1*	18.1	2.4	10.5	10.5	9.1	14.5	16.5
1960	14.3	12.5	5.0	10.6	-2.1	15.1	6.4	10.3	16.5	12.3
1970	10.2	10.2	4.9	7.9	6.1	16.2	8.2	5.3	13.4	11.0
1980	5.4	5.3	1.8	1.7	11.2	1.8	2.6	2.8	11.4	12.9
1990	4.1	5.7	2.6	*3.5*	2.2	5.7	2.5	3.3	9.8	5.5
1995				*2.8*					*6.7*	

Italics: Changes for non-decennial periods, according to censuses held outside of a year ending with 0 or 1; other non-comparable data, e.g. for reason of territorial changes (France).

For BRD data related to 1989 territory of Western Germany computed by Stat. Bundesamt.

Hibernia: 43.1% for three decades.

Canada: cfr. population developing counts:

1901 : 6.0 %
1911 : 34.2 %
1921 : 21.3 %
1931 : 18.1 %
1941 : 10.9 %
1951 : 18.6 %
1961 : 30.2 %
1971 : 16.8 %
1981 : 12.9 %
1991 : 12.1 %
1996 : (7.4 %)

For earlier data, after estimated population figures of HAMELIN (1969):

1891 : 11.7 %
1871 : 13.1 %
1851 : 37.7 %
1831 : 37.0 %
1881 : 17.3 %
1861 : 31.9 %
1841 : 45.1 %
1821 : 35.3 %

Table 4
Demographic indicators of megalopolitan areas (1,000 inhabitants)

Year	Populaton (1,000)			Density (inhabitants/sq.km)			Intercensal change (%)		
	NWEur	NEA	Japan	NWEur	NEA	Japan	NWEur	NEA	Japan
1820/1	38,202	*(7,342)*	–	79	*(5.13)*	–	–	–	–
1830/1	41,930	*(9,727)*	–	87	*(6.79)*	–	9,8	*(62.4)*	–
1840/1	45,621	*(12,756)*	–	92	*(8.91)*	–	8.8	*(31.1)*	–
1850/1	49,288	*16,976*	–	102	*11.85*	–	8.0	*(33.1)*	–
1860/1	52,906	*22,183*	–	110	*15.5*	–	7.3	*(30.1)*	–
1870/1	57,190	*26,593*	36,288	118	*18.6*	98	8.1	*19.9*	–
1880/1	64,272	*32,085*	38,166	133	*22.4*	103	12.4	*20.7*	5.2
1890/1	70,616	*38,073*	40,353	146	*26.6*	109	9.9	*18.7*	5.7
1900/1	79,418	45,000	43,785	164	31.6	118	12.5	18.2	8.5
1910/1	89,558	53,296	49,066	186	37.5	133	12.8	18.4	12.1
1920/1	94,025	61,749	55,391	195	43.5	150	5.0	15.9	12.9
1930/1	101,425	71,833	63,872	210	50.6	173	7.9	16.3	15.3
1940/1	...	76,142	71,400	...	53.8	193	...	6.0	11.8
1950/1	114,270	86,174	83,200	237	61	225	*12.8*	13.2	16.5
1960/1	125,517	101,278	93,419	260	72	252	*9.8*	17.7	12.3
1970/1	136,242	113,317	103,720	282	80	280	8.5	11.9	11.0
1980/1	139,327	*116,020*	117,060	289	*82*	316	2.3	*2.4*	12.9
1990/1	143,860	122,102	123,557	299	86	334	3.3	*5.2*	5.5
1995/6									
Area 1991 sq.km	482,127	1,492,266	370,285						

- Data not available.
( ) Rough estimations for the Canadian Megalopolitan area.
Italics : Rupture in historical series.
Two decimal fractions are indicated only for NEA, for lower densities until 1860, and one until after World War II.

decades 1940/1950 and 1950/1960, including also neutral countries (Switzerland, Sweden). In Japan the highest registered figure ever (16 percent) is that of 1940/1950; in the same period, Western Germany's population grew over 18.1 percent, due to the arrival of people expelled from earlier German territory or occupied countries.

Data for Canada are not listed in **table 3** itself, but recorded as a footnote, due to already mentioned statistical uncertainties; there are similarities between both North American countries, the "peaks" being higher in Canada than in the USA, e.g. 1960/1961: 30.2 percent vs. 18.5 percent or 1840/1941 : 45.1 percent vs. 32.7 percent, due to different immigration policies.

Demographic indicators of megalopolitan areas: Table 4 deals – probably for the first time in the framework of comparative studies – with the long-term historical retrospect of the three megalopolitan areas of the developed world.

Currently (1990/1991) the three areas have a population in a close range: in Europe (NWEur) 144 million, in North America (NEA) 122 million and Japan (JAP) nearly 124 million inhabitants. The historical evolution is as follows:

Table 5
The historical evolution of three megalopolitan areas

Year	NWEur	NEA	JAP
1820	38	7.3	-
1870	57	27	36
1930	101	72	64
1990	144	122	124

(1 million inhabitants)

A series of maps on the evolution of the USA – here excerpts for the years 1720 and 1790 (*Geographical Review,* vol. 30, no. 3, 1940) (cf. fig. 7) – emphasizes as a major graphic demographic feature the developing North East Corridor. In Europe of the Congress of Vienna (1815) the urban structure is more balanced, with major foci in the Midlands, the Rhine Meuse Delta, the Normandy-Seine-Loire Valley, the Rhone Valley – the densest – and Northern Italy.

In 1820 the ratio between NWEur and NEA was 5.2/1; 50 years later, only 2.1/1; between NWEur and JAP 1.6/1. In that period (1870) the population growth trend of both areas is reinforcing, in clear relationship with the strongly progressing industrial development, while the demographic take-off of Japan occurred a generation later (1900).

Due to World War I, there is a demographic slowing down between 1910 and 1920 in Europe, without any feedback on America, where the economic crisis of the 1930s is clearly marked: strong in the USA, less in Canada.

1940 is a turning point towards a very dynamic population growth both in America and Japan; comparable data for non-neutral European countries are lacking for the period of World War II, but the so-called baby boom is manifest overall for the decade 1950-1960, continued during the "Golden Sixties."

The decade 1970-1980 is another trend inflection for NWEur and for NEA: should we emphasize the first oil crisis of 1973? Japan's population growth however started slowing down only ten years later (1980).

The major trends of the population dynamics are completed by the figures in the third column of **table 4** indicating intercensal changes.

For NWEur three peaks (over 10 percent growth) appear: 1870/1880, 1890/1910 and after World War II, the latter due to the baby boom. Two other periods could be amalgamated, since for the decade 1880/1890 the growth is 9.9 percent: the 40-year period before World War I was indeed marked by a growing prosperity too in Western Europe.

In North America, as already mentioned, intercensal change figures have another significance, at least before 1860 when figures over 30 percent decennial change indicate clearly population growth due to immigration. Figures around the 30 per-

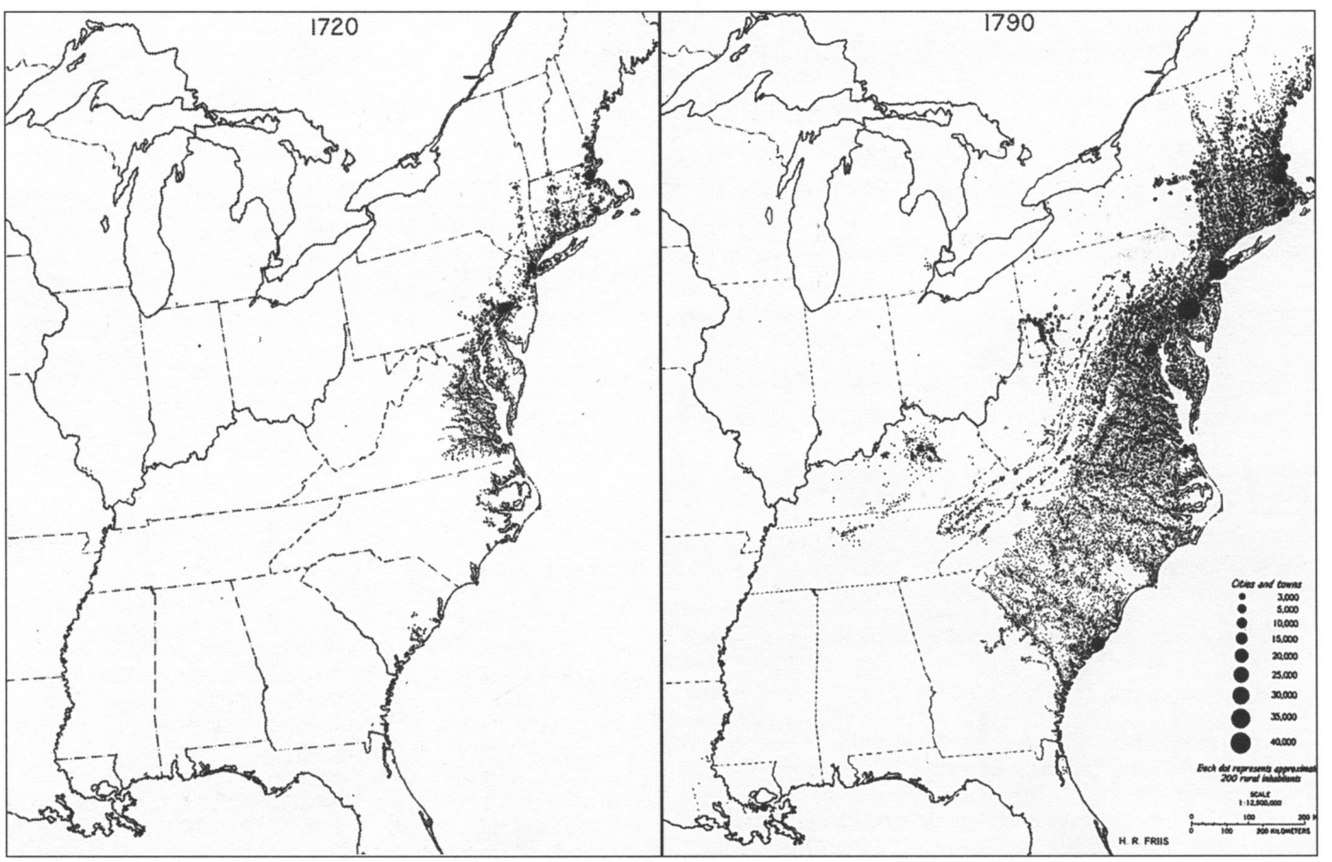

Fig. 7: USA – Demographic evolution of the North East Corridor, 1720 and 1790. *(Source:* Excerpt from *Geographical Review*, vol. 30, no. 3, 1940).

cent mark half a century until 1910, followed by 16 percent growth for 20 years (1910-1930). The crisis decade 1930/1940 was already stressed as well as the post-World War II peak, culminating in 1950/1960, contrary to Japan and also a bit later than in NWEur.

The weakest figures of the 170-year long period are those of the decade 1970/1980 on both sides of the Atlantic (2.3 percent and 2.4 percent respectively); the subsequent recovery is very slow in Europe (3.3 percent in 1980/1990), two points higher (5.2 percent) in America, about on the same level as in Japan (5.5 percent).

sis years and the New Deal of Roosevelt); between 1940 and 1970 the dynamic retakes with subsequent slowing down – a general feature of the ending 20th century.

Further, more detailed comparative figures at the level of "conurbation" are given in **Appendix 2** for the BIG TEN of each of the analyzed megalopolitan areas, including variants for the main German conurbation of "Rhine-Ruhr" of which unity is still being discussed.

Finally, as a useful comparison (1990/1991), the proportion of the "megalopolitan" population in Western Europe (seven

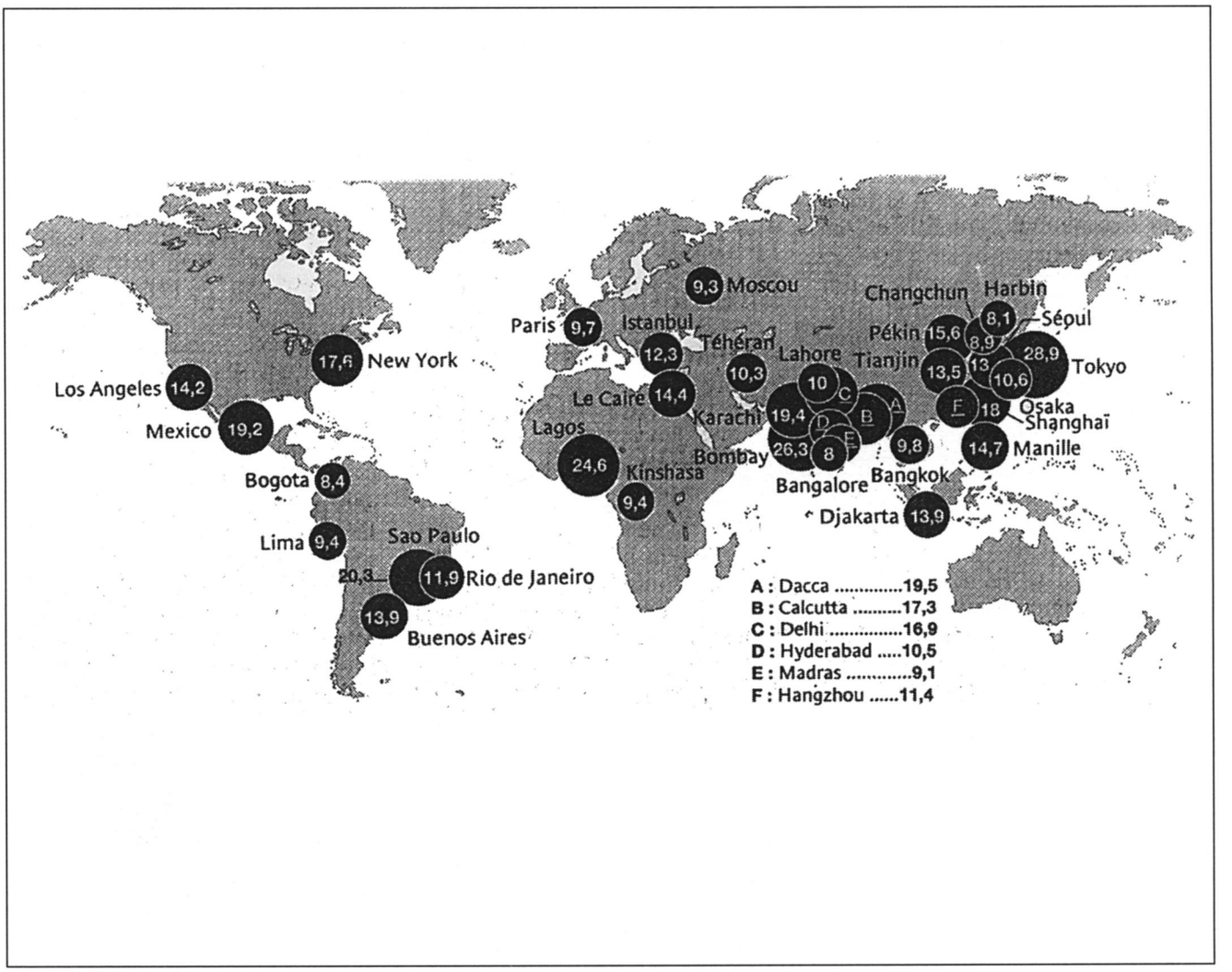

Fig. 8: Megalopolises with more than 8 million inhabitants in 2015. *(Source: Courrier de l'Unesco, June 1999).*

The figures of population density trends (**table 4**) require the following comments:

Japan's population density started (1870) from a lower level: 98 inhabitants/sq.km than that of the NWEur and showed first a slower acceleration, but since 1900 it is a similar one; after World War II the two trends are running parallel until 1970, a changing threshold in European population dynamics. Concerning the NEA, due to the much more extended megalopolitan area (3x that of Europe and 4x that of Japan), the comparison of a density indicator is less easy; the general trend is however growing until a deceleration between 1930 and 1940 (cri-

countries) – (if the former German Democratic Republic (DDR) is included in the total – which was not the case in our first study) is 65 percent. This ratio shrinks to 44 percent in North America (two countries, but still 56 percent for Canada alone). In Japan we considered the entire country as "megalopolitan" (as could be South Korea in case of extension of the area around the Sea of Japan). Leaving aside the northern and less densely populated island (Hokkaido 5.6 million inhabitants, density 62 inh/sq.km), the central and southern islands of Japan would score 95 percent with 398 inh./sq.km vs. 298 in NWEur and 86 in NEA megalopolitan areas (cfr. **table 4**).

Megalopolitan areas in a global world perspective

Since our first study, the so-called term "globalization" became familiar in science, media and industrial and social affairs. But *nihil novi sub sole,* already after World War II, Wendell L. Wilkie, candidate for the US presidency, spoke of "One World" which was indeed materially proved by ... Magellan's circumnavigation of Earth ... four centuries ago. Cosmonaut's fascinating view and meteo-sat TV news became parts of our daily life. Every week new books are published on "global society," of which "Megalopoles" are also a concern for Unesco (*Courrier de l'Unesco,* June 1999) (fig. 8).

The very important contribution made by the Athens Center of Ekistics, an international team led by C.A. Doxiadis and John G. Papaioannou under the title *Ecumenopolis, the Inevitable City of the Future* (1976), is long known and quoted (cfr. especially chapter 24).

Concerning the megalopolitan areas, a possible "global" approach could be threefold:

- Examination whether the delineation made in 1970 is still accurate: some extensions are thinkable, for NWEur towards Central Europe, for NEA towards the South (cf. **Appendix 3**) and Japan could be considered being in closer relationship with the mainland, first with South Korea or, if political changes allow, further to NW, around the Sea of Japan *(ibid.),* similar to NWEur, today around the North Sea.
- Further emerging megalopolitan areas could also be considered such as:
  - In **South America**: the Buenos Aires-Montevideo-Porto Alegre-São Paolo-Rio de Janeiro corridor;
  - In **Africa**: the north coast of the Gulf of Guinea from Abidjan until Yaounde via Accra-Lagos-Port Harcourt-Douala.
  - In the **Middle East**: a renewed edition of the "Croissant Fertile" from Cairo until Kuwait via Alexandria-Tel Aviv-Jerusalem-Amman-Beirut-Damascus-Haleb (= Aleppo) - Adana-Diyarbakir-Mosul-Baghdad-Basra-Abadan (provided the pending tension is peacefully settled), three countries entirely and parts of six others;
  - In **Europe,** when the Western Mediterranean Sea becomes, as in the past, a factor of integration, a sui generis megalopolitan area is thinkable, including one country entirely (Italy) and the Mediterranean regions of France and Spain, and coastal areas with the bulk of the population of three countries (Morocco, Algeria, Tunisia) giving a total of 150 million inhabitants (like the NWEur Megalopolis).

What about the more densely populated areas in the Far East, with +/-2,500 million inhabitants, 42 percent of the world's population, particularly in China: the coastal areas and the valleys of the Yellow and Yangtze rivers; in the Indian subcontinent the valleys of Bramaputra, Ganges and Indus as well as the Southern peninsula?

There are indeed in the eight continental countries concerned of South and East Asia, 186 conurbations ("agglomérations urbaines") with more than 500,000 inhabitants (of which 71 over 1 million) and a further 16 (of which 12 over 1 million) in the islands of Indonesia and the Philippines.

It is however questionable whether all these areas could be classified as megalopolitan since that term is – according to the above definition – hardly to be applied to regions where the majority of the population is settled in rural areas (overcrowded indeed) with a relative high number of towns/conurbations, slums included.

Finally a few remarks on axes, corridors, networks of megalopolitan areas, a paramount tool of integration in and between these major urban concentrations.

Let us only focus on the high speed train (HST/TGV) revolution, reshaping the space deserving important agglomerations, e.g. 59 minutes for a Lille-Paris trip (220 km), surprisingly seldom scrutinized in megalopolitan studies, duration corresponding to a normal suburban commuter route. Also a Lyon-Paris (450 km) trip in 2 hours allows a daily return.

As for transborder traffic, major "missing links" were completed or are under construction (Eurotunnel, Great Belt bridge and tunnel to "Norden" and new Alpine tunnels (Mt. Cenis, Gotthard) to Southern Europe.

If the German economist J.H. von Thunen (1783-1850) had had the opportunity to check the pertinence of his theories (*Der isolierte Staat,* 1824) one and a half centuries after and looking for an Isolated State, e.g. such as Taiwan, the Chinese island earlier called Formosa, he would have been surprised to know that this country has chosen that type of corridor development.

- Before then, as an example and archetype of corridor development seems to be Japan, a pioneer in new railway technology: the Tokkaido-Sanyo line and its successive extensions are well known. Current yearly traffic: 140 million passengers, cumulated traffic since open (1964): 2.5 billion. One is however less aware of the very reasons of that innovation which lie in the physical constraints that make the country hostile to man: seismic and volcano hazards, strong climatic conditions (-40°C of winter temperature in Hokkaido, at latitude 44° North, like Nice, Rimini, Yalta), a difficult orography: mountains and hills with over 15 percent slope cover 3/4 of the area of which 16 percent only is flat land; the land use is characterized by an extremely high portion of forest (68 percent!), leaving for the ecumene a limited area with population densities over 1,000 inh./sq.km (in 7 of 47 prefectures). This is a crowded urbanized area of which the central part, Tokyo-Nagoya-Osaka/Kobe, less than 400 km long, concentrates in 1970 as many inhabitants as the US NE corridor, i.e. 40 million, grown today (1990) to 50.4 million.

The first ten conurbations of Japan total 60.3 million inhabitants, i.e. nearly half (48.8 percent) of the national population. Their postwar increase (average over 40 years) is 145 percent (1950: 24.6 million and 1990: 60.3 million) with a range of 102 to 176 percent (except Kitakyushi 33 percent) as listed (cfr. **Appendix 2**). The Japanese urban pattern is nearly "ideal" for HST development: a linear (corridor) structure with high density and mobile urban population; it is however sui generis due to the still ongoing increase, much over the national demographic growth for the same period (cfr. **table 1**): 48.6 percent, a percentage which emphasizes continuing population flows into urban areas.

- This is, in general, no more the case in the NEA Megalopolis – with a few remarkable exceptions – as Toronto/Hamilton, Washington/Baltimore and Montreal metro areas as shown in the same listing. The first ten metro areas (8 US, 2 CDN) total (1990, without non-urban hinterlands) 61.1 million inhabitants, nearly the same number as in Japan, and 50.0 percent of the total population of NEA, but show a growth rate of only 53.1 percent (vs. 1950: 39.9 percent), i.e. about three times less than the Japanese "Big Ten" increase.

Concerning fast intercity passenger traffic, in NE America, the "North East Corridor" (Boston-New York-Washington) has been in the highlight since the end of the 1950s: planning of "Metroliner" and studies on the Megalopolitan Seaboard could not be separated. **Appendix 3** indicates the secular population trend in the first seven major US metro areas as well as HS Rail corridors designated by the US Dept. of Transportation (cf. map): none of them have been initiated. Junctions might be possible with – not yet planned – HS lines in Canada (Toronto-Montreal-Quebec) at the Detroit/Windsor and Buffalo/Hamilton border – near cities.

- Contrary to that situation *pro futuro in spe*, in the NW Eur Megalopolis we can already travel on a real network of transnational

TGVs that perform and are time saving, which have grown rapidly from a French pioneer project, the TGV Paris-Lyon.

The European high speed network will cover nearly the entire continent (fig. 9) by the horizon of the year 2020, a paramount achievement after the first trunk line already in service in 2001. We hope to be able to analyze the feedback of this network on the megalopolitan area in a few years.

Notes

1. To be compared to the "Urbanized Seaboard of the United States" between Boston and Washington, DC: 41.1 million inh., 296 sq.km, as delineated by Gottmann, 1961.
2. For example, the 2001 decennial census in Belgium was replaced by a so-called social inquiry, issued by and to be returned to the Statistical Office. More than 200,000 replies (nearly 4 percent of the households) are still missing and should be collected by extra agents.
3. English version, p. 7; the prospective population growth was 50 percent: from 13.5 to 20 million in one generation!

References

BERRY, B.J.L. (1973), "The changing scale and nature of American urbanization," in Japan Center for Area Development Research, *Seminar on the International Comparative Study of Megalopolises,* June 25-28 (Tokyo), pp. 44-98.

DOXIADIS, C.A. and J.G. PAPAIOANNOU (1974), *Ecumenopolis, The Inevitable City of the Future* (Athens, Athens Center of Ekistics).

EHRLICH, P.R. (1968), *The Population Bomb* (New York, Ballantine Books).

GOTTMANN, J. (1961), *Megalopolis, The Urbanized Northeastern Seaboard of the United States* (New York, Twentieth Century Fund).

—— (1967), "Why the skyscraper?" in B.W. Eldredge, *Taming Megalopolis,* vol. 1 (New York, Doubleday).

—— (1973), "Megalopolitan growth around the world, A theoretical approach," in Japan Center for Area Development Research, *Seminar on the International Comparative Study of Megalopolises,* June 25-28 (Tokyo), pp. 27-43.

JAPAN CENTER FOR AREA DEVELOPMENT RESEARCH (1973), *Seminar on the International Comparative Study of Megalopoli-*

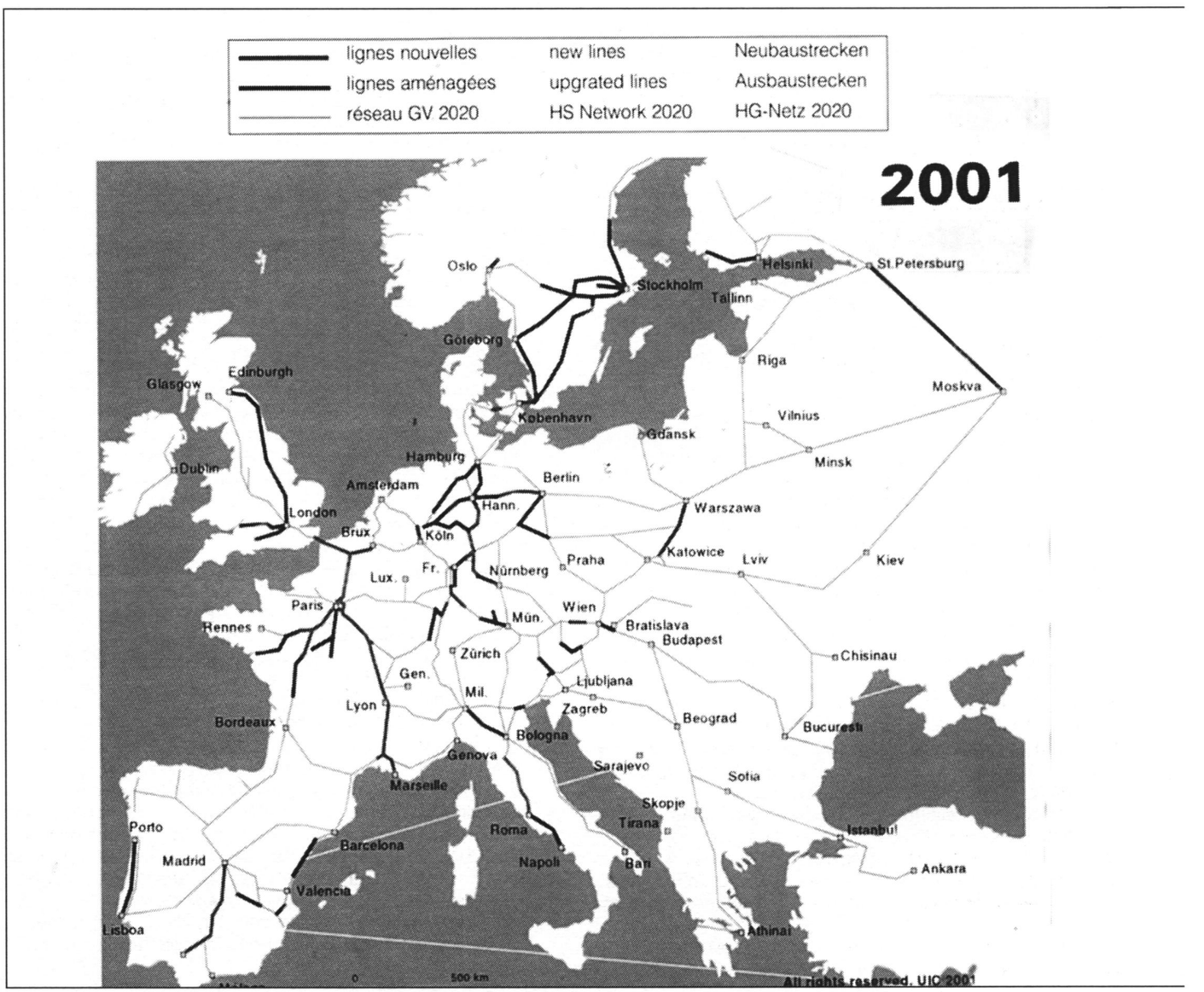

Fig. 9: European High-Speed Network 2001-2020. *(Source: Agenda 2002,* Paris, International Union of Railways (UIC)).

ses, June 25-28 (Tokyo).
KAHN, H. and A.J. WIENER (1967), *The Year Two Thousand* (New York, Macmillan).
KORMOSS, I.B.F. (1961), Map of the Evolution of the Population in NW Europe 1951-1961, 2 sheets, CRENO-CRONWE, printed by IGN Brussels, Scale 1:500,000.
—— (1971), "Vers une Mégalopolis européenne?" *CE Brussels-Luxembourg, Documentation européenne,* 8p + 2 maps; IDEM in Dutch, German and Italian.
—— (1999), "Similarities and dissimilarities in the so-called corridor development: compared examples from Europe, North America and the Far East," in Ryszard Domanski (ed.), *The Changing Map of Europe, The Trajectory Berlin-Poznan-Warsaw, A Tribute to Antoni Kuklinski* (Warsaw, Oficyna Wydawnicza, "Rewasz").
LEMAN, E. (1998), "The Yangtze megalopolis," *Ekistics,* vol. 65, no. 388/389/390 (Jan.-June), pp. 65-71.
LEY, N. (1967), "Die Zukunft der Raumordnung in Nordwest Europa," in Z.IJ. van der Meer, op. cit., pp. 145-157.
von MALCHUS, V. Frhr (1975), "Partnerschaft an europäischen Grenzen," in *Europäische Schriften des Instituts für Europäische Politik,* vol. 39/40 (Bonn).
MUMFORD, L. (1967-1969), "The mission of the city," in C.E. Elias, Jr. et al. (eds.), *Metropolis Values in Conflict* (Belmont, CA, Wadsworth), Cfr. pp. 44-50 reprinted from L. Mumford (1961), *The City in History* (New York, Harcourt).
MUSCARÀ, C. (ed.) (1978), *Megalopolis Mediterranea* (Milan, F. Angeli).
PRACCHI, R. (1978), "Movimenti di popolazione in Lombardia nel periodo 1951-1971," Fig. 5 maps at scale 1:750,000 in Muscarà (1978), *op. cit.*
STAMP, D.L. (1952), *Our Undeveloped World* (London, Faber & Faber), Cfr. map, p. 49.
TOYNBEE, A. (1894), *Industrial Revolution of the 18th Century in England, Popular addresses, notes and other fragments together with a short memorandum by B. Jowett* (London, Longmans Green), 4th ed. with appendix.
UNESCO (1997), *Distribution de la population du monde – Distribution of the World's Population* by D. Noin, G. Decroix, Collab. A. Ahmad, I.B.F. Kornoss, M.T. Gutierrez, D. MacGregor and M. Siryani (Paris, Edition UNESCO), Scale 1:15,000,000).
VAN DER MEER, Z. IJ. (ed.), Voorzitter van de Rijksplanologische Commissie (1967), *Wegwijzers, naar een goed bewoonbaar Nederland.* Voorwoord H. Witte, Minister VRO (Housing and Planning), Alphen a.d. Rijn, M. Samson Uitg.

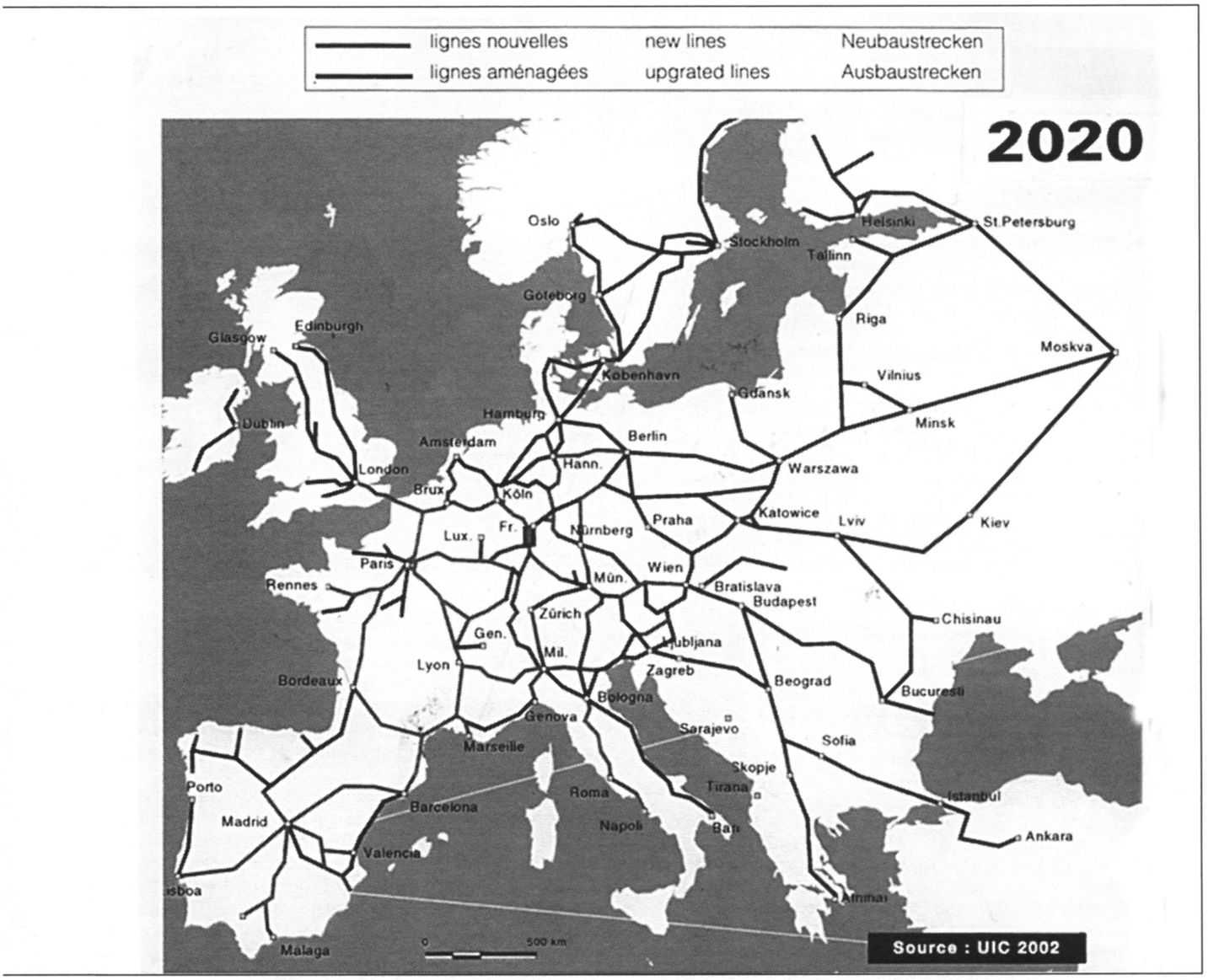

Fig. 9: (cont'd)

Appendices

The three appendices to which references are made in the text are as follows:

Appendix 1: The case of Canada
Appendix 2: The "Big Ten" of megalopolitan areas
Appendix 3: The case of possible extension of North American megalopolitan areas

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APPENDIX 1

The case of Canada

The N.E. American Megalopolis (NEM) is a transfrontier area between USA and Canada, that boundary, drawn in the Treaty of Versailles in 1783 remaining without change now for more than two centuries, a remarkable stability versus the frequently changing European frontiers.

Also, the U.S. part of the NEM was easy to delineate since detailed census reports are available from 1791 on: that area concerns currently 19 U.S. States and in the historical series before 1850, 18 States, Wisconsin joining the USA in 1848. The respective areas are: 19 States, 1,254,490 sq.km; 18 States, 1,112,433 sq.km.

These rough figures underline the structural differences between the subdivision of the megalopolitan areas: as for the North West European Megalopolis (NWM) and Japan, the overall population density is around 300 inh/sq.km (298 and 334 respectively) to be compared to that of the USA. In that figure the Canadian part of the NEM is *not* included, major difficulties arising through non-comparable statistical areas, to be used within the provinces Ontario and Quebec, too large for detailed demographic approach.

The two provinces with megalopolitan areas were step by step enlarged to the North – as the whole Confederation, with an important advance of frontier to the North but the bulk of population remained in the S.E.; therefore population density figures (1991) such as for Quebec 5.1 or Ontario 11.0 inh/sq.km are very rough averages for areas of 1,357,800 and 916,700 sq.km respectively, together 2.4 million sq.km, the same area as "EUR12" but with a density of 148 inh/sq.km!

This population distribution is taken into account by Canadian geographers through a distinction of so-called **ECUMENE** (French **OECUMENE**) from non-inhabited areas; a continuous ecumene is located in the **Prairie Provinces** (Southern parts) and much more to the East, from **Lake Huron** to the **St. Lawrence estuary.** Between the two ecumenes several W-E and a few N-S population corridors irrigate the otherwise tiny or non-inhabited landscapes. The Eastern ecumene largely corresponds to the historical Lower and Upper Canada and could be delineated by Sault Ste Marie-Sudbury-Quebec.

For our first study we used a comprehensive delineation based on intraprovincial economic regions (1961 Census) distinguishing 10 economic regions in Prov. Quebec of which 4 (Côte-Nord & Nouv. Québec, Gespesie et Rive Sud, Saguenay & Lac St. Jean and Ouest du Québec méridional) were left out in defining the megalopolitan area. In Prov. Ontario, also from 10 regions just one (Ontario West) was neglected. The "megalopolitan" population of these provinces is shown in the following table:

Table 1
Canada – Megalopolitan population of the provinces of Quebec and Ontario (1,000 inh)

	(a)		(b)
Quebec	4,345	Total provinces	5,259
Ontario	6,019		6,236
Total	10,364		11,495

Note: Proportion of megalopolitan population (a/b): 90.2 percent.

The more detailed census divisions (99 for Prov. Quebec and 60 for Prov. Ontario) allowed a finer approach: all units with less than 10 inh/sq.km have been eliminated, i.e. 36 units in Quebec and 11 units in Ontario, leading to the following figures for the Canadian megalopolitan region:

Table 2
Canadian megalopolitan region

	Quebec	Ontario	2 Prov.
Area in sq.km	73,300	104,800	178,100
Population (1,000)	5,839	9,409	15,248
Density (inh./sq.km)	79.2	90.0	85.6

The figures (1991) for the entire area of Canada: 9,203,210 sq.km, population: 27,297,000 inh., thus density: 2.97 inh/sq.km; the proportions of the megalopolitan region to the country: area 1.9 percent, population 55.9 percent.

These figures could complete those related to the U.S. part of the NEM, being aware of the dichotomy of data on both sides of the U.S.-Canadian border. The following table, recapitulating data since the beginning of the 20th century, shows this clearly. If the overall trend of the proportion of the population of the megalopolitan area of N.E. America is decreasing (1900/1: 55.4 percent, 1950/1: 52.1 percent and 1990/1: 44.2 percent) the diminution is only 9.3 points for the Canadian part of NEA (1901: 65.2 percent, 1951: 53.6 percent and 1991: 55.9 percent), thus a concave curve starting and finishing much higher than that of the U.S. megalopolitan parts (1900: 54.4 percent, 1950: 52.0 percent and 1990: 43.0 percent) a nearly straight decreasing curve vs. the growing population of earlier peripheral areas. New York ranked first in 1900 and 1950, but second in 1990, after California and third in 1996, after California, and Texas, and followed, as fourth, by Florida.

Table 3
Northeast American megalopolis: Comparative demographic data for Canadian and U.S. part 1900/01-1990/91

	Year									
	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
Population (1,000)										
Ont.	2,182.9	2.527.3	2,933.7	3,431.7	3,787.7	4,597.5	6,236.1	7,703.1	7,932.9	10,084.9
Qué.	1,648.9	2,005.8	2,360.5	2,874.7	3,331.9	4,055.7	5,259.2	6,027.8	5,829.2	6,895.9
Total	3,831.8	4,533.0	5,294.2	6,306.4	7,195.6	8,653.2	11,495.3	13,730.9	13,825.2	16,980.8
Megalopolitan Population (1,000)										
Ont.	2,067.6	2,305.9	2,676.7	3,099.0	3,375.8	4,136.0	5,641.2	7,087.1	*7,290.0*	9,408.8
Qué.	1,434.9	1,748.8	2,052.9	2,504.1	2,832.9	3,372.6	4,533.1	5,284.6	*5,165.0*	5,839.8
Total	3,502.5	4,054.7	4,729.6	5,603.1	6,208.7	7,508.6	10,174.3	12,371.7	*12,455,0*	48.6
Megalopolitan Density (inhabitants/sq.km)										
Ont.	19.7	22.0	25.5	29.5	32.2	39.5	53.8	67.6	*69.5*	89.7
Qué.	19.6	23.9	28.0	34.2	38.6	46.0	61.8	72.1	*70.5*	79.7
2 prov.	19.6	22.8	26.6	31.5	34.9	42.2	57.1	69.5	*69.9*	85.6
Megalopolitan Population vs. Total Population (%)										
Ont.	94.7	91.2	91.3	90.3	89.1	90.0	90.5	92.0	*91.9*	93.3
Qué.	87.0	87.2	87.0	87.1	85.5	83.2	86.2	87.6	*87.7*	84.7
2 prov.	91.4	89.4	89.3	88.8	86.3	86.8	88.6	90.1	*90.1*	89.8
Total National Population (1,000)										
CDN	5,371.3	7,206.6	8,787.9	10,376.8	11,506.7	14,009.4	18,238.2	21,568.3	24,343.2	27,296.9
USA	76,212.2	92,228.5	106,021.5	123,202.6	132,164.6	151,325.8	179,323.2	203,302.0	226,542.2	248,718.3
Total	81,158.5	99,435.1	114,809.4	133,579.4	143,671.3	165,335.2	197,561.4	224,870.3	250,885.4	276,015.2
Percentage of Megalopolitan Population (%)										
CDN	65.2	56.3	53.8	54.0	53.9	53.6	55.8	57.3	*51.2*	55.9
USA	54.4	53.4	53.7	53.8	52.9	52.0	50.1	49.6	*47.0*	43.0
2 countries	55.4	53.6	53.8	53.8	53.0	52.1	51.3	50.4	*46.2*	44.2

APPENDIX 2

The "Big Ten" of Megalopolitan areas

1,000 inhabitants, in decreasing order of 1990/1 figures of 10 conurbations ranking first in each area and percent of change. (*Source*: *Geopolis Database*).

N.B. We are using, here, the term *conurbation,* in order to distinguish these figures from those of official (Census) data, delineated on the basis of countries and therefore often different from Geopolis data, based on morphological criteria. Example (US, 1990) CMSA's (= Consolidated Metropolitan Statistical Areas) vs. Geopolis "conurbations" (1,000): New York 19,549 vs. 23,901, Chicago: 8,240 vs. 8,907, Washington/Baltimore 6,726 vs. 5,332, Boston: 5,455 vs. 5,206, Detroit (US only): 5,187 vs. 4,142 (US + CDN) ... St Louis 2,432 vs. 1,947. US Bureau of Census lists 40 metro areas of at least 1 Million population (= 53.4 percent of the US population in 1990 – 54.5 percent in 1994). The cumulated population of *all* metro areas was in 1990 79.4 percent (79.8 percent in 1994 vs. 76.2 percent in 1980).

NE American Megalopolis

	Conurbation	1950	1990	+ %		Conurbation	1950	1990	+ %
1	New York	17,363	23,901	37.6	6	Detroit/Windsor*	2,978	4,142	39.1
2	Chicago/Milwaukee	6,070	8,907	46.7	7	Montreal	1,354	2,871	112.0
3	Washington/Baltimore	2,460	5,332	106.7	8	Cleveland/Akron	2,022	2,674	32.2
4	Boston	3,858	5,208	35.0	9	Cincinnati/Dayton	1,264	2,043	61.2
5	Toronto/Hamilton	1,384	4,201	203.5	10	St Louis	1,400	1,947	39.1

* US + Canada

Japan

	Conurbation	1950	1990	+ %		Conurbation	1950	1990	+ %
1	Tokyo	10,428	28,738	175.6	6	Kitakyushu	1,167	1,558	33.5
2	Osaka	6,790	14,983	120.7	7	Hiroshima	570	1,417	148.6
3	Nagoya	3,150	6,708	120.0	8	Sendai	488	1,129	131.4
4	Fukuoka	676	1,894	180.1	9	Nara	377	1,098	161.2
5	Sapporo	442	1,864	321.7	10	Okayama	506	1,020	101.6

NW European Megalopolis

	Conurbation	1950	1990	+ %		Conurbation	1950	1990	+ %
1	Paris	6,362	9,312	46.4	6	Manchester	2,508	2,204	-12.2
2	London	8,961	7,385	-17.6	7	Cologne/Bonn (Rh-R) c	1,363	2,147	57.5
3	Essen (Rhein-Ruhr) a	4,065	4,598	13.1	8	Hamburg	1,817	2,051	16.6
4	Düsseldorf (Rh-R) b	1,984	2,461	24.0	9	Brussels	1,584	1,845	16.5
5	W-Midlands (Birmingham)	2,352	2,225	-5.4	10	W-Yorkshirre (Leeds)	1,509	1,434	-5.0

variant:

1a	Rhein-Ruhr (a+b+c)	7,412	9,206	24.2	10a	Rotterdam	1,042	1,355	30.0
9a	Frankfurt + Wiesbaden + Mainz	1,315	1,832	39.3					

Note: In West Germany, conurbations (24) were defined by Government decision of January, 1967 including – ranking first **Rhein-Ruhr** Verdichtungsraum (10,412,000) above nos. 3, 4 and 7 listed separately by Geopolis: Rhein-Main Verdichtungsraum covering Frankfurt, Wiesbaden, Mainz and intermediate areas, ranking 2 (2,375,000). Using these territorial definitions but with data Geopolis (less than official figures) Rhein-Ruhr would rank after Paris (1a) and Rhein-Main after Brussels (9a). As 10th Rotterdam would appear in the list.

APPENDIX 3

The case of possible extension of North American megalopolitan areas

W.K. REILLY (1973): The Rockefellers Brothers Task Force Report made projections for population and land use in urban regions, year 2000. As for population, the middle fertility assumptions (curve E, figure 1, p. 78, with 2.1 births per woman) proved to be nearest to the current (1996) population figures, i.e. 265 million inhabitants. As for the assumed further extension of urban regions within and around Mid and Southern Appalachia, the following States would be concerned: North and South Carolina, Kentucky, Tennessee, Alabama and Georgia. Other major extensions were assumed on the Southern Coast (Texas, Lousiana and particularly Florida), as well as in California, assumptions today are a reality as shown by the changing rank of the seven "first" States of the USA from 1900 until 1990 (1,000 inhabitants).

1900		1950		1990	
New York	7,269	New York	14,830	California	29,758
Pennsylvania	6,302	California	10,586	Texas	19,966
Illinois	4,822	Pennsylvania	10,498	New York	17,991
Ohio	4,158	Illinois	8,712	Florida	12,936
Missouri	3,107	Ohio	7,947	Pennsylvania	11,883
Texas	3,049	Texas	7,711	Illinois	11,431
Massachusetts	2,805	Michigan	6,372	Ohio	10,847

Accordingly, the delineation of the NEA Megalopolis could be extended in order to include Memphis, Birmingham, Atlanta, Charlotte and Norfolk Metro areas, the last two being on the route of the new North East Corridor, as shown on the following US Department of Transportation map.