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Jefferson, Mark Sylvester William. Mark Sylvester William Jefferson was born the seventh child of Daniel and Mary Jefferson on 1 March 1863 in Melrose, Massachusetts. His father, a lover of literature, nurtured the young Mark, who became a member of the class of 1884 at Boston University. Academic success led to his appointment (1883–86) as assistant to Benjamin Apthorp Gould, director and astronomer of the National Observatory of the Argentine Republic at Cordoba, membership in the Argentine Geographical Society (1885), and management of a sugar estate in Tucuman Province (1886–89). Jefferson returned to Massachusetts, taught at boys' schools, studied at Harvard with Nathaniel Southgate Shaler in 1892 and with William Morris Davis from 1896 to 1898, and then took a post with the Michigan State Normal School at Ypsilanti in 1901. There he taught until 1939, offering a total of sixty-five different courses. From 1897 to 1941 he published some 160 books and articles, 140 reviews in the *Bulletin of the American Geographical Society* (retitled the *Geographical Review* in 1916), and presented thirty-three papers before the Association of American Geographers (Martin 1968, 327–41). For his contribution he was awarded the Cullum Gold Medal from the American Geographical Society (1931) and the Helen Culver Gold Medal from the Geographic Society of Chicago (1932).

Throughout these years Jefferson's keenest geographic interest was the study of population distribution—anthropography was his term for it. Many of his books and articles contained explanations and cartographic illustrations of these distributions. His maps were accurate, attractive, and invariably ingenious in design. He had large glass slides made of these maps and many of his photographs, and his classes frequently constituted an annotated succession of slides. Students were continually obliged to construct maps. Additionally, a special-

ized course in cartography was offered on a regular basis, a rarity at that time. During his career he published what he was to call "the six-six world map giving larger, better continents" (Jefferson 1930). This eliminated much ocean, allowing larger landmasses, and became popular in the classroom.

It is probable that Jefferson taught more than 10,000 students, of whom 80 percent became teachers who further spread the cartographic habit. Most distinguished among these students were Isaiah Bowman, R D Calkins, Charles C. Colby, Darrell Haug Davis, William M. Gregory, George J. Miller, and A. E. Parkins. Of these, Bowman, Colby, and Parkins were elected to the presidency of the Association of American Geographers, an honor accorded Jefferson in 1916. When Bowman became director of the American Geographical Society in 1915, he corresponded vigorously with his former teacher, whom he invited to head the 1:1,000,000-scale Hispanic map project of the Society. Although Jefferson declined, he prepared his student Raye R. Platt, who would hold that post from 1923 to 1938. Bowman agreed with Jefferson's request that map work be paid for at parity with narrative for the *Geographical Review*. He urged Jefferson to make a study of Argentina, Brazil, and Chile (with maps) showing German population concentrations in South America, and then placed Jefferson in charge of the Inquiry cartographic program. In this context it was not without significance that Jefferson had published *Notes on the Geography of Europe* in 1917, a small book replete with twenty-nine maps. This had been preceded by a number of published articles concerning Europe and a number concerning cartography. His competence in French, Spanish, Portuguese, German, Italian, Norwegian, Danish, Greek, and Latin enabled him to deal with the representatives of foreign powers who visited Society rooms often with special pleading concerning impending boundary revision.

Appointed chief cartographer of the American Commission to Negotiate Peace, Jefferson was sent to Paris in December 1918 aboard the USS *George Washington*. There, representatives from twenty-seven nations met, hoping to create a lasting peace. In the Hotel Crillon Jefferson established U.S. cartographic headquarters

and had Charles G. Stratton and Armin K. Lobeck appointed his first and second assistants, respectively. With help from draftsmen and others, many maps were made. These became scattered at the close of the Paris undertaking, but the total likely exceeded 1,800. For the most part, Jefferson designed the maps, which Stratton or Lobeck then executed. Maps concerning colonial matters were reduced and collected into the Red Book, and maps concerning European matters were entered into the Black Book—both were referred to as “bibles” at Paris (see figs. 646 and 647). Enriched by his associations, especially with the French geographers, Jefferson left Paris on 1 June 1919. Even so, he was disappointed with the results of the undertaking, later writing that the boundary lines had been drawn in blood. He died in Ypsilanti, Michigan, on 6 August 1949.

GEOFFREY J. MARTIN

SEE ALSO: Paris Peace Conference (1919)

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John Bartholomew & Son (U.K.). The origins of the world-renowned mapmaking business of the Bartholomew family can be traced to the vibrant cultural and literary atmosphere created in Edinburgh by the Scottish Enlightenment of the eighteenth and nineteenth centuries. From the flourishing Scottish academic, artistic, and literary scene flowed new ideas that, together with new prosperity in the city, resulted in heightened demand for books. A number of printing and publishing houses established at that time engaged skilled engravers, who produced illustrations: portraits, views, diagrams, and maps (Moir 1973, 124–34).

Among these houses were William and Daniel Lizars, W. & A. K. Johnston, and John Bartholomew. Although they began as general engravers, the latter two began to specialize in maps and became major British map publishers. John Bartholomew was apprenticed to William Home Lizars, where his father, George Bartholomew, had been employed since 1787. John set up as an independent engraver in 1826. His skills passed to his son, John Bartholomew II. By the late nineteenth century the company was established and had moved from routine engraving of pocket watches, show cards, and book illustrations to specializing in the precise art of map compilation, engraving, and lithographic printing (Smith 1998, 23–24).

In 1888, on his father’s retirement, John George

Bartholomew took over the management of John Bartholomew & Co., marking “a watershed in the firm’s history” (Gardiner 1976, 34). His diligence gave the business new impetus, transforming it from competent tradesmen into a successful worldwide publishing house. Rather than produce maps for others to sell, the company started to publish under its own name. John George’s first step in building the business was arranging a partnership with the publisher Thomas Nelson, and, to mark the seriousness of his work, he renamed his offices the Edinburgh Geographical Institute. He was impressed by the German research approach to cartography, particularly the atlases created by Adolf Stieler and his successors for the publisher Justus Perthes in Gotha (Bartholomew 1902, 36–38). The arrangement with Nelson & Sons lasted until 1911, when Bartholomew moved into custom-built premises with expanded facilities and equipment in Duncan Street, Newington. In 1919 the company was registered as a limited company, John Bartholomew & Son Ltd.

John George Bartholomew associated with many geographers, scientists, and explorers, among them Dr. George Goudie Chisholm, Sir Patrick Geddes, and Sir Ernest Henry Shackleton, gaining geographical intelligence and ideas valuable for updating his products and also new clients. He prepared maps of the results of the oceanographic *Challenger* Expedition (1872–76) for Sir John Murray, the maps for Murray’s *Bathymetrical Survey of the Scottish Fresh-Water Lochs* (1910), and also Sir Archibald Geikie’s *Geological Map of Scotland* (1892).

A significant series of maps designed with his father was *Bartholomew’s Reduced Ordnance Survey of Scotland* at the scale of a half inch to one mile, based on the Ordnance Survey one-inch-to-one-mile series. It was completed in 1889 in twenty-nine sheets and extended to cover Great Britain in 1903. On it the visual picture of land relief was enhanced by contour layer tints, where intervals between contours were colored in deepening shades of browns or greens. Extremely popular, it continued in demand by cyclists and motorists until the 1970s. Maps from that series also appeared in the *Survey Atlas of Scotland* (1895) (fig. 418) and its companion volume for England and Wales (1904). Contour layer tints had originated in Europe during the 1830s (Nicholson 2000, 123) but were adopted, effectively designed, and popularized by Bartholomew, influencing the maps of many other publishers, including the British Ordnance Survey.

The range of work produced by the firm under John George’s leadership mirrored the diverse activity of the period. Maps were published for cyclists, automobile clubs, railway companies, and businesses. Also produced were small-scale maps and city plans (fig. 419) for



FIG. 418. DETAIL FROM BARTHOLOMEW'S ATLAS OF SCOTLAND SHOWING FORT WILLIAM REGION, WESTERN SCOTLAND, 1:126,720. This portion on the Bartholomew half-inch-to-one-mile contour layer-colored map of Scotland illustrates the progression of colors from light lowland to dark upland.

Size of the entire original: 43.5 × 54.8 cm; size of detail: ca. 15.3 × 26.3 cm. From John George Bartholomew, ed. *Royal Scottish Geographical Society's Atlas of Scotland* (Edinburgh: Edinburgh Geographical Institute, 1895), sec. 19, pl. 28. Image courtesy of the National Library of Scotland, Edinburgh.



FIG. 419. JOHN GEORGE BARTHOLOMEW, *CHRONOLOGICAL MAP OF EDINBURGH*, 1919, CA. 1:190,080. This example of a Bartholomew city map and legend depicts the urban growth of Edinburgh over time.

Size of the entire original: 42.7 × 55.5 cm; size of legend: 10.3 × 4.9 cm; size of detail: 10.3 × 12.3 cm. From *Scottish Geographical Magazine* 35 (1919), between 280 and 281.

bookstall sale or to illustrate guidebooks, educational maps and atlases for home and overseas markets, and even mission atlases. Major atlas publications included general atlases, such as the *Citizen's Atlas of the World* (1898); innovative thematic atlases, including the *Atlas of the World's Commerce* (1907); and perhaps most ambitious, a physical atlas (in the style of the classic *Physikalischer Atlas* [1838–48] of Heinrich Berghaus), planned to appear in five volumes but of which only two volumes were completed: *Atlas of Meteorology* (1899) and *Atlas of Zoogeography* (1911) (Smith 1998, 26).

John George epitomized the intellectual spirit of his time, particularly as a promoter of geographical education and as cofounder of the (Royal) Scottish Geographical Society in 1884, becoming one of its initial two honorary secretaries (Lochhead 1981, 104–5). In 1909 he was awarded an honorary doctorate of laws from Edinburgh University with the citation “a very Prince of Cartographers . . . [who] had done more than any other man to elevate and improve the standards and methods of cartographical workmanship.” In 1910 he was appointed geographer and cartographer to King George V (Bartholomew and Winch 2009).

Bartholomew's reputation for high-quality products led the *Times* (London) newspaper to commission a major new world atlas to replace their existing volume, first published in 1895 and based on German cartography. World War I and John George's failing health delayed the project, but, following his death in 1920, it was eventually completed by his son, John (known as Ian) Bartholomew. *The Times Survey Atlas of the World* (1922) contained, as detailed on its title page, “a comprehensive series of new and authentic maps reduced from the national surveys of the world and the special surveys of travellers and explorers” that depicted the changed landscape following the Great War. It was the first of twelve editions (fig. 420) (Barclay 2004, 22–25).

John (Ian) had studied geography in Leipzig, Paris, and Edinburgh and possessed the family qualities of sensitivity and attention to detail, plus the vision to take the business forward while facing the demands of the postwar world. He oversaw the production of new atlases, including *The Times Handy Atlas* (1935), *The Edinburgh World Atlas* (1954), and the *Road Atlas of Britain* (1943), as well as revisions of existing titles, such as *The Graphic Atlas*, *The Citizen's Atlas*, and *The Survey Gazetteer of the British Isles*. He devised a number of new map projections for depicting global routes or distributions more clearly and was also concerned with the improvement and efficiency of production techniques. Flatbed printing from heavy lithographic stones was replaced in 1925 by the much faster and more versatile rotary offset machine, which could print a sequence of color images rapidly with considerable economy of cost.

In 1928 a large process camera was installed so that patched-up engraved images or new hand-drawn maps could be transferred to glass plates and, from the 1950s, to film for plate making.

During World War II the company printed maps for the War Office, including silk escape maps (Bond 1984). At the end of the conflict the *Times* newspaper decided that Bartholomew should prepare a new atlas incorporating postwar changes and providing a portrait of the world as it then stood. John (Ian) had suffered bad health since his army service and was becoming more frail. His three sons entered the business following their war service, ready to undertake the new atlas and carry on. John Christopher qualified in geography, Peter Hugh in accountancy, and Robert Gordon in printing, making them well fitted for the family business. Through their combined expertise the new five-volume *Times Atlas of the World, Mid-Century Edition* was completed in 1959, with John (Ian) Bartholomew as its editor. This atlas was redesigned, revised, and published in single-volume format as *The Times Atlas of the World, Comprehensive Edition* (1967), along with editions in French, Dutch, and German. Other titles produced in association with Times Newspapers (later Times Books) were *The Times Concise Atlas of the World* (1972) (a reduced version of *The Times Atlas*), *The Times Atlas of the Moon* (1969), and *The Times Atlas of China* (1974). In addition to maintaining their general list of road maps, atlases, overseas travel maps, city plans, and numerous contract orders, they also produced the *Family Atlas of the World* (1983) (fig. 421) and the popular *Reader's Digest Great World Atlas* (1961), followed by fifteen overseas editions.

Growth in business and overseas contracts led the three brothers to strengthen their business framework in 1968 by appointing a professional managing director, David Andrew Ross Stewart, and experienced marketing and sales managers. A sales force was engaged and a new warehouse and bindery established.

As the Bartholomew brothers neared retirement, the prospect loomed of new technology that would transform the techniques of mapmaking and need high investment to carry it out. In 1980 Ross Stewart saw through a buyout of the company by Reader's Digest, which was followed in 1985 by the acquisition of the company by News International, owner of the *Times* (London) newspaper. Four years later Bartholomew merged with a sister company, HarperCollins, and moved in 1995 to the latter's premises in Bishopbriggs, just north of Glasgow, incorporating the newly acquired companies of Geographia and Robert Nicholson. The company continued business under the HarperCollins name but with the Bartholomew brand name used for the sale of cartographic data (fig. 422).



FIG. 420. DETAILS FROM THREE EDITIONS OF THE MAP OF MEXICO. Examples from three atlas editions produced by Bartholomew for the *Times* newspaper illustrate changing cartographic styles, for example, of the development from hand-engraved to typeset lettering. From left to right: *The Times Survey Atlas of the World*, prepared at the Edinburgh Geographical Institute under the direction of John George Bartholomew (London: Times, 1922), pl. 95 (1:5,000,000); *The Times Atlas of the World*,

Mid-Century Edition, vol. 5, *The Americas*, ed. John (Ian) Bartholomew (London: Times Publishing, 1957), pl. 113 (1:5,500,000); and *The Times Comprehensive Atlas of the World*, 10th ed., "Millennium edition" (London: Times Books, 1999), pl. 110 (1:5,500,000).

Images courtesy of the National Library of Scotland, Edinburgh. Permission courtesy of HarperCollins Publishers Limited, Hammersmith.

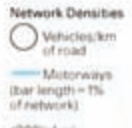
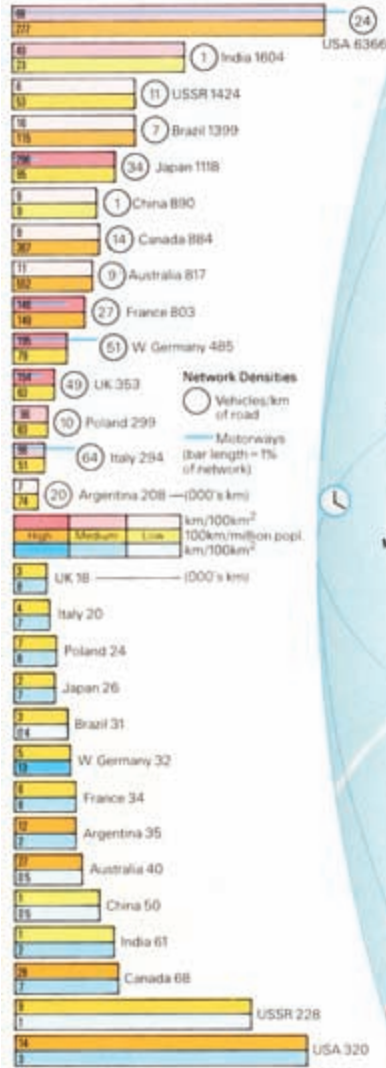
TRANSPORT NETWORKS

Trade and travel is indispensable to civilisation, with the ship as the main carrier of the world's commerce. The continuous development of routes and modes of transport aids economic progress and mobility.

Road and Rail

Integrated road and rail networks are the basis of industrialised society. Containerisation and the extension of modern highway systems have increased flexibility and reduced the emphasis on railways transporting freight.

Roads—comparative lengths (Log scale)



Railways—comparative lengths (Log scale)

High Medium Low
 km/100km²
 100km/million pop.
 km/100km²

Journey Time

The Suez Canal cuts 3600 n.miles off the London-Singapore route, while Concorde halves the London-New York journey time.

Air and Sea Routes

A great-circle network of primary air routes centred on the Northern Hemisphere provides rapid transit across the globe for mass travel, mail and urgent freight.

Bulk carriers, also following great-circle arcs, ply the oceans between major ports to supply the commodities of world trade.



FIG. 421. TRANSPORT NETWORKS, 1983. The innovative use of projections to show global patterns, such as transport networks, is characteristic of Bartholomew atlases. Size of the original: 28.2 × 19.9 cm. From John Christopher

Bartholomew, ed., *Family Atlas of the World* (Edinburgh: John Bartholomew & Son, 1983), 28. Image courtesy of the National Library of Scotland, Edinburgh. Permission courtesy of HarperCollins Publishers Limited, Hammersmith.



FIG. 422. DETAIL FROM *TÍR CHOLM CILLE*, GAELIC MAP OF SCOTLAND, ISLE OF MAN, AND IRELAND, 2003, 1:1,200,000. This digitally produced map, edited by R. N. Pedersen, cartography by Collins Bartholomew, is dominated by the cultural landscape, whose Gaelic place-names demonstrate the effectiveness of automated name placement. Size of the entire original: 75.7 × 37 cm; size of detail: 10.7 × 11.4 cm. Permission courtesy of Colmcille.

Experiments in computer-aided cartography had begun in the early 1960s, mainly by government and academic agencies, while commercial mapmaking companies remained tentative about the cost effectiveness of its introduction. However, the potential could be seen, and in the early 1980s Bartholomew started conducting software tests; the first products were produced from data converted from vector to raster format and plotted to photographic film using a Scitex Response 280 system. To resolve problems with the management and structuring of the data, the geographical information system and mapping software ARC/INFO of the Environmental Systems Research Institute (ESRI), based in California, was chosen in 1989 for the capture of all spatial data; Bartholomew was their first commercial user. In addition, an ORACLE relational database management system was introduced for all attribute data, including the coding of geographical features and place-names (Orr 1991, 31). A new suite of databases including world 1:10,000,000, 1:5,000,000 plus Europe 1:1,000,000, U.K. 1:250,000, and London 1:10,000 and 1:5,000 were recompiled from new source materials. Those digital files soon replaced the vast store of film files used to produce all past products. Other problems, such as name placement and reprojection, were resolved by ESRI's Maplex system.

Data for new products were cut from the database according to specification and finished with desktop publishing and computer-to-plate technology.

New digital products began to appear, initially sheet maps of the world and road maps of the United Kingdom followed by new international travel maps for overseas tourism. Digital data were sold direct to customers for various applications, including use on the Internet. The first digital world atlas produced from the database was *The Times Atlas of the World, Concise Edition* (1995) retaining the style of former editions. Four years later the tenth edition of the company's largest and most complex digital product, *The Times Comprehensive Atlas of the World* ("Millennium edition," 1999), was published. It had the same appearance as the previous editions but had been completely updated with new thematic world maps and scales adjusted to focus on areas of current interest.

Toward the end of the century the introduction of digital mapping had speeded up production time, enabling frequent revision and more up-to-date products. The long-standing tradition of accuracy of revision data and place-name spellings, coupled with good map design, ensured the continuance and popularity of the company's products.

KENNETH L. WINCH

SEE ALSO: Atlas: (1) Thematic Atlas, (2) World Atlas; Marketing of Maps, Mass; *Times Atlas of the World*; Wayfinding and Travel Maps: Escape and Evasion Map

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Journalistic Cartography. The phrase *journalistic cartography* refers to maps found in the news media. In

the early part of the twentieth century this largely meant newspapers and magazines but widened later to include television and other electronic media. This essay surveys journalistic cartography in the United States and Western Europe, and pays special attention to the major periods of change in the genre, primarily in the middle of the twentieth century—driven by a global war—and in the late decades of the century, when new technologies made it far easier for the media to incorporate maps.

One of the ironies of journalistic cartography is the degree to which it developed independent of professional cartography. In part this was due to the type of maps demanded by journalism: straightforward, relatively simple, and serving a particular story. These qualities explain why much journalistic cartography was influenced by graphic artists employed by the news media, who were themselves trained in art, architecture, and graphic design. Furthermore, journalistic cartography developed in an industry beholden to different limitations than those of professional cartographers, such as more frequent and shorter deadlines, wider circulation, and different audiences with different expectations.

Journalistic cartography originated in newspapers. The rapid growth of newspapers in the nineteenth century gave the medium tremendous ability to circulate maps to a wide audience, perhaps even wider than atlas readers or schoolchildren. By the early twentieth century, there were more than 2,500 daily newspapers in the United States. At about the same time, the development of photoengraving allowed printers to incorporate maps more frequently, and at a lower cost. From 1885 to about 1897, photoengraving replaced woodblock, reducing the production time of maps from a matter of days to a matter of hours. Photoengraving vastly expanded the visual dimension of newspapers and laid the groundwork for the introduction of maps as a familiar aspect of the daily news (Monmonier 1989, 32, 39–47).

Even so, the availability of maps was not the primary force behind their use in newspapers and magazines. In fact, Michael Heffernan (2009, 265–67) suggests that just prior to the turn of the century elite newspapers in France and Britain generally resisted their inclusion. Editors were reluctant to bear the minor additional costs incurred by these maps and perhaps more importantly associated the maps with the more sensationalistic mass-readership newspapers, which stressed visual content, short articles, and simple language. Only when the news necessitated maps—primarily as illustrations or explanations for military conflicts such as the Anglo-Boer War or the Russo-Japanese War—did editors embrace their use. So while changes in technology made journalistic cartography possible, the deciding factors were often the attitudes of editors and the exigencies of the news itself.

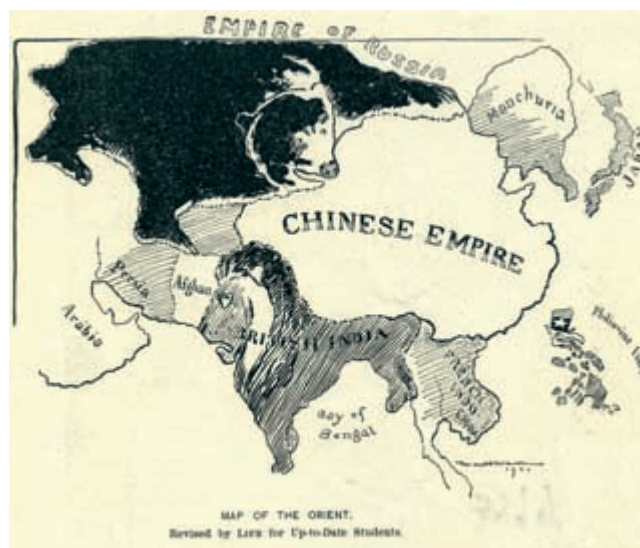


FIG. 423. *MAP OF THE ORIENT*, 1901. Size of the original: 10.6 × 12.8 cm. From *Life*, 22 August 1901, 152.

This might explain the relatively sporadic attention to journalistic cartography over the course of the century.

In the United States, maps also began to proliferate after 1900 as accompaniments to news stories as well as stand-alone illustrations and editorials. Typical of this last category is the *Map of the Orient* from 1901 (fig. 423), which parodies the imperial presence in Asia on the part of Russia, England, and even the United States. The map is at once informational and editorial, geographic and pictorial. It also suggests the degree to which journalistic cartography in the early decades of the century—in France and Britain as well as the United States—grew out of imperialism and international conflict. Similarly, the *Prosperity Map* of 1915 (fig. 424) translates at a glance the relatively dry figures of national productivity and does so in an appealing pictorial manner that could be understood by readers with limited education.

World War I became a tragically familiar subject for newspaper and magazine maps and firmly established the relationship between war and popular cartography. Yet the role of cartography in this war was unlike that of later conflicts. The initial expectations of a short campaign evaporated with the development of trench warfare. Thus the maps of the conflict appearing in both American and European newspapers and magazines quickly took on a character and quality that would remain for much of the war itself. Maps of the Western Front demanded little creativity given the entrenchment of the belligerents and actually highlighted the degree to which the war's geography was static rather than dy-



FIG. 424. PROSPERITY MAP OF THE UNITED STATES, 1915. Size of the original: 8 × 11.5 cm. From *Bankers' Magazine* 90, no. 2, February 1915, 185.

namic. Throughout the war, British and French newspapers continued to publish maps of the front, which were important to families hoping to locate loved ones. At the same time, newspapers began to print large-scale maps that misleadingly characterized the significance of minor geographic gains and losses. After the war's conclusion, the sheer complexity of the peace agreements sustained map use through the early twenties (Heffernan 2009, 293 and *passim*).

In the United States as well, the war spurred the appearance of maps, typical of which was a 1918 map in which a bold black line suggested not just the line between forces but its relative immovability (fig. 425). The Western Front moved so little that this map was termed a “reference map” of the Western Front. Yet amidst the innumerable examples of traditional representations of the front, we find a few unconventional maps as well, such as the 1914 depiction of the German retreat from France (fig. 426). The ability of this map to depict movement and direction hints at the perspective maps that would grow in popularity with the rise of aviation.

One of the earliest artists to experiment with changing perspective was Charles Hamilton Owens, who combined cartography with drawing in a way that carried wide appeal with the general public. In the 1920s, Owens began drawing landscape paintings for the Automobile Club of Southern California, and these suggested both his artistic training as well as his sense of perspective. His use of bird's-eye views—a popular cartographic form for cities in the nineteenth century—strongly in-

(Facing page)

FIG. 425. REFERENCE MAP OF THE WESTERN FRONT, 1918. Size of the original: 29.7 × 20.5 cm. From the *Independent*,

formed his later work (fig. 427). At the same time, consider his remarkably early use—1928—of the global perspective to explain the crash of the airship *Italia* (fig. 428). Owens's thirty-year tenure at the *Los Angeles Times* afforded him the opportunity to develop pictorial maps that would shape the cartographic sensibility of countless readers. He was immersed not just in concepts of aviation, but also of modernity, motion pictures, and storytelling, all of which informed his cartographic style and the culture of Southern California (Cosgrove 2005, 46–47). His pictorial maps, found in the pages of the *Times* from the 1930s into the 1950s, covered a tremendous range of subjects.

Like Owens, Richard Edes Harrison also considered himself an artist rather than a cartographer and drew his news maps with a keen awareness of design. Harrison's epic 1939 map of New York City demonstrated the artist's eye for deploying color and categories to translate the immense power of this modern cosmopolitan center (fig. 429). While the material for the map drew largely from the City Planning Commission's series of maps issued in 1935, Harrison designed and updated this particular version. The inset maps, lower right, demonstrate the changing population of New York over the course of a single day. Harrison draws on information from the census as well as economic figures in order to transform Manhattan into a living entity, with a daily life cycle all its own.

Journalistic cartographers such as Harrison and Owens reinvested cartography with artistry and individuality, characteristics that ironically had been eroded by the very advances in printing that had made cartography a mass medium. While the artistic training of these journalistic cartographers prepared them to experiment, another impetus for this proliferation of newspaper maps was the political upheaval of the 1930s. The Italian invasion of Ethiopia, the Japanese invasion of China, the Nazi invasion of the Rhineland, and the Spanish Civil War were the most dramatic of many political developments that sparked particularly urgent and stark cartographic representations.

The most influential venue for journalistic cartography in the 1930s and 1940s was *Fortune*, which included color maps as early as its first issue in February 1930. The editors hired architects and artists with a new charge of creating maps uniquely designed to illustrate the news of the moment. Several of these maps, such as Harrison's *The Not-So-Soft Underside*, juxtaposed scale to bring the topography into high relief (fig. 430). This dramatic approach to perspective and exaggeration of

7 September 1918, 304. Image courtesy of the Joseph Regenstein Library, University of Chicago Library.



REFERENCE MAP OF THE WESTERN FRONT

The middle line shows where the opposing armies now stand. The line on the left marks the extreme limit of the German advance in August, 1914. That on the right, the so-called Hindenburg line, is the position to which the Germans withdrew in March, 1917, and from which they advanced in March, 1918. Between these two limits the tide of battle has ebbed and flowed for more than four years.

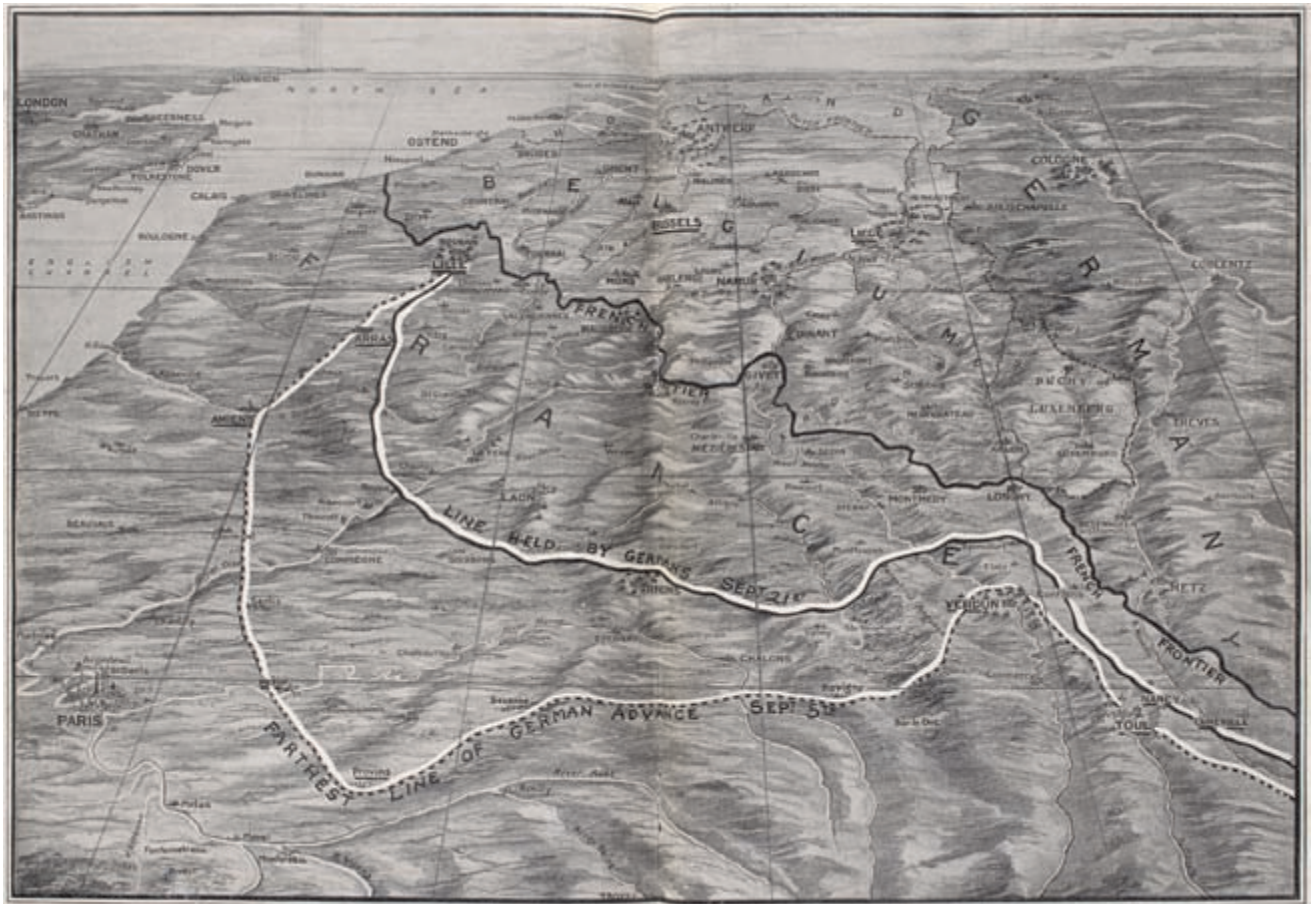


FIG. 426. THE RECEDING LINE OF THE GERMAN INVADERS OF FRANCE, 1914. Size of the original: 30.2 × 40.6 cm. From the *Independent*,

28 September 1914, 440–41. Image courtesy of the Joseph Regenstein Library, University of Chicago Library.

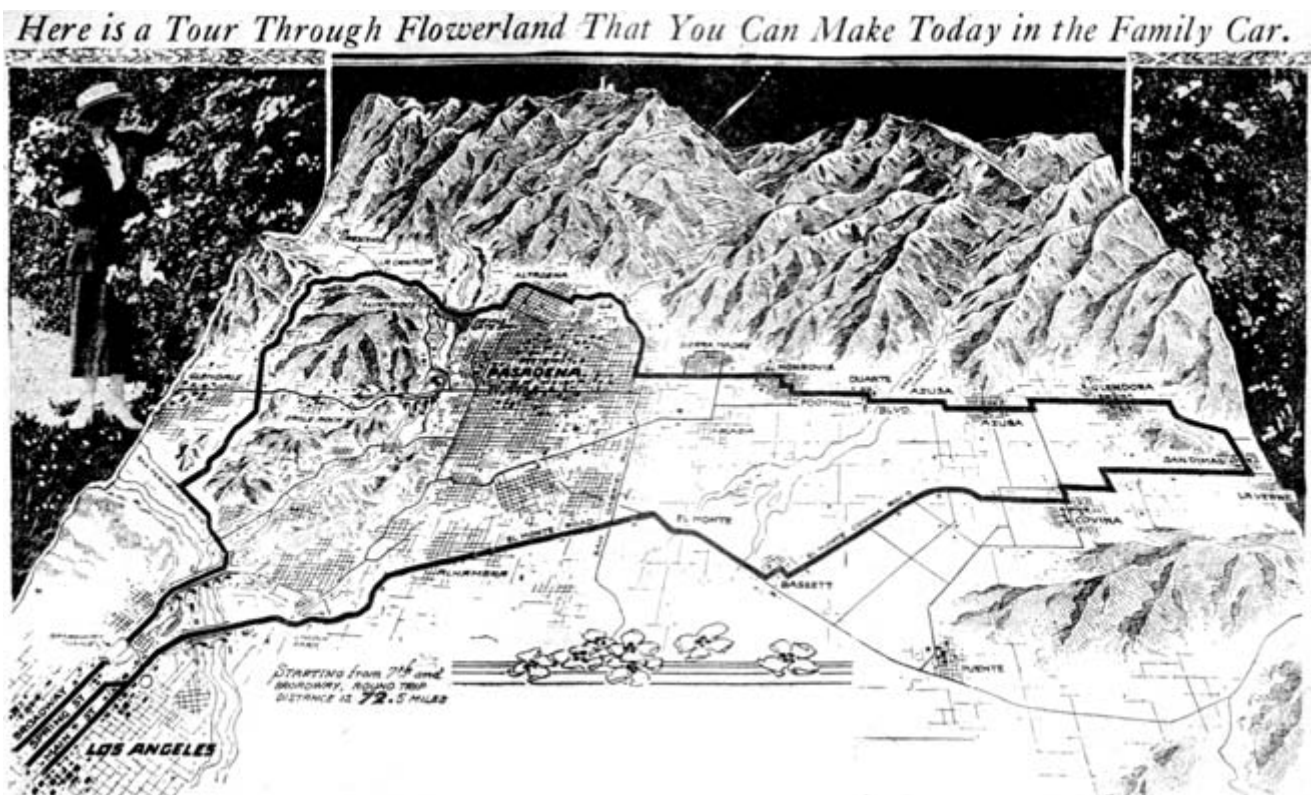
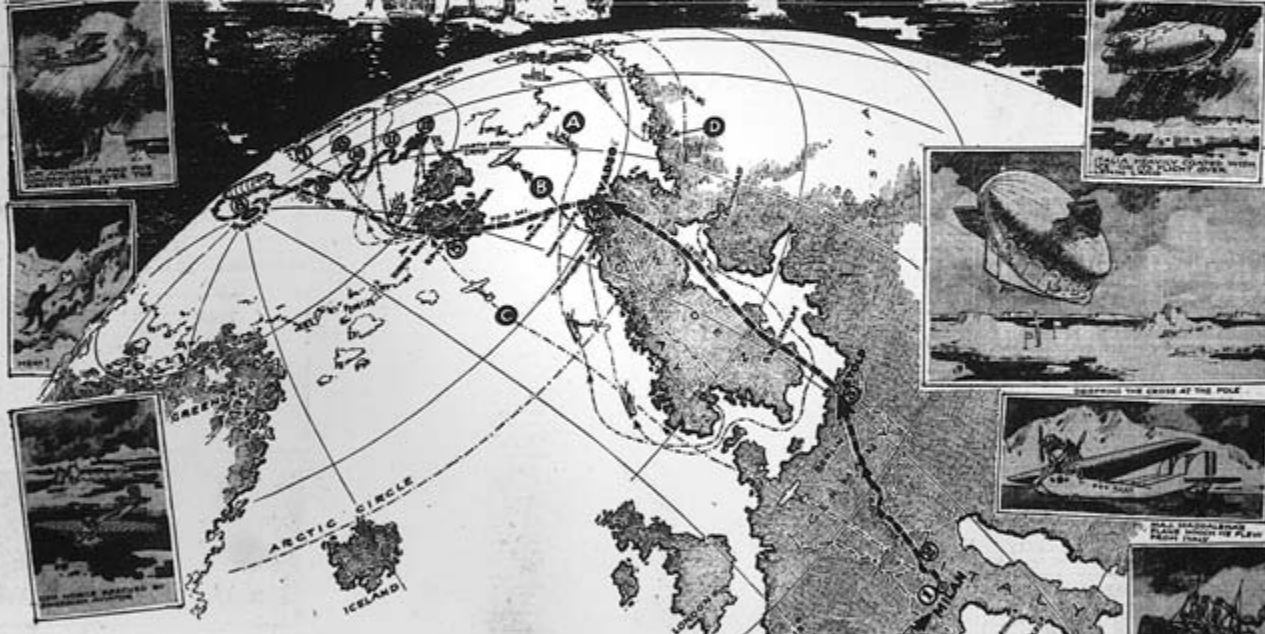


FIG. 427. CHARLES OWENS, HERE IS A TOUR THROUGH FLOWERLAND THAT YOU CAN MAKE TODAY IN THE FAMILY CAR, 1921.

From the *Los Angeles Times*, 1 May 1921, VI1.

World Weeps And Cheers As Story Of Italia Tragedy Unfolds



The Tragedy of the Frozen North

Map diagram and sketches by Times Staff Artist Charles Owens of the illustrated polar flight of the Italia and the heroic efforts to rescue her company. The following refers to the numbers in the drawing above:

1. Italia with crew of 16 men under Gen. Umberto Nobile starts from Milan, Italy, April 15.
2. Lost in storm over mountains, sends up rocket signals.
3. Damage stabilizer in landing at Stolp, Germany, after flying 20 hours and 40 minutes.
4. Leaves Stolp May 3. Lands May 4 at Vadso, Norway, after successful 1200 mile flight.
5. May 5, leaves for Kinga Bay, where she lands next day, weathering snowstorms. In constant communication with her base ship, City of Milano.
6. May 11, attempts flight to Lewis Land, but fog, touches Franz Josef Land, returns and loses rear gondola motor in landing.
7. May 15, succeeds in flight over Lewis Land, ship coated with ice, cruises over unexplored area and after 68 hours in air returns to Kinga Bay.
8. May 23, Italia leaves Kinga Bay 4:40 a.m., reaches North Pole next day 1 a.m., cruises around pole half hour, drops flag and crew, and starts back.
9. Italia encounters heavy blizzard on return trip. Last radio received from her at this point 10 a.m., May 24.
10. May 25, Italia crashes into ice; one man killed, two injured.
11. Nobile and six men land with gondola. One bag of Italia with eight men drifts away to east.
12. June 12, Nobile and party on ice 500 miles of Northwest Land drifting with ice.
- A. Russian ice breaker Krusenstern was sent into ice fields from Leningrad.
- B. June 18, Amundsen and five men leave Tromsø in seaplane to search for Italia crew and air loss.
- C. Maj. Maddalena's flight from Italy to Kinga Bay to aid in rescue—first to drop food to lost men on flight from Kinga Bay.
- D. Russia searches arctic area of Siberia and Novaya Zembla, starting icebreaker Malgoin from Archangel.

FIG. 428. CHARLES OWENS, THE TRAGEDY OF THE FROZEN NORTH, 1928.

From the Los Angeles Times, 17 July 1928 (part II), 12. Copyright © 1928. Los Angeles Times. Reprinted with permission.

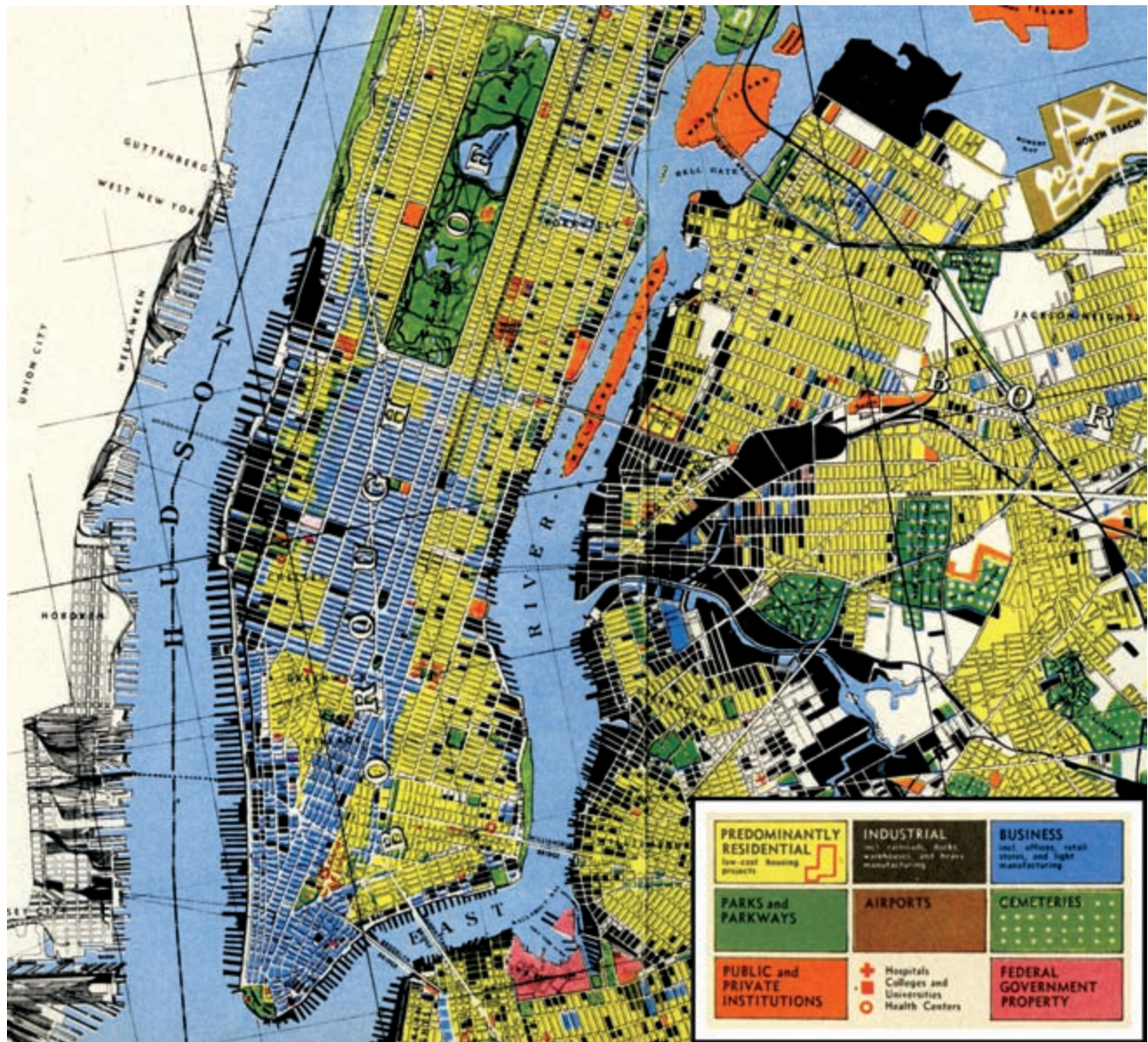


FIG. 429. DETAIL FROM RICHARD EDES HARRISON, *THE CITY OF NEW YORK*, 1939.

Size of the entire original: 69 × 56 cm; size of map detail: 15.8 × 17.3 cm. From *Fortune* 20, July 1939, 66–67, 70–71.

topography and scale was used by journalistic cartographers throughout the 1930s and 1940s, as in LeRoy Appleton's 1937 *Hitler-Eye View of Britain* (fig. 431). By orienting west at the top of the map, the reader achieved a German "view" of the British Isles—quite literally the view of the Wehrmacht. *Fortune* became one of the most important venues for these types of maps, which dropped off sharply after 1945 due to a change in editor but also the end of the war.

This international upheaval coincided with the height of the public's fascination with the new and experimental maps produced by these journalistic cartographers.

Harrison, Owens, and Appleton joined many others in what seemed to be a golden age of pictorial cartography. And while war gave these men no end of subject material, it was their particular style of cartographic execution that won them such wide attention and readership (Ristow 1957, 374–78). For instance, from February 1942 to August 1945, the *Los Angeles Times* issued nearly 200 full-page color maps drawn by Owens. Part of his style was to decorate and frame his maps with sketches that enhanced the drama and recognizability of the subject or place depicted, which gave his maps the immediate and intense feel of reportage. Like Harrison



FIG. 431. LEROY APPLETON, *SHADOWS ON THE NORTH SEA: A HITLER-EYE VIEW OF BRITAIN, 1937*.

Size of the original: 23.6 × 28.3 cm. From *Fortune* 15, March 1937, 101.

and others, Owens worked from a globe and designed his images to translate the spherical geography of the earth onto a map. As Denis E. Cosgrove imaginatively writes, the most salient influence over Owens's work seemed not to be cartographic principles, but rather the storyboard that guided his neighbors in Hollywood (Cosgrove 2005, 46–50).

At the *New York Times*, Emil Herlin and his staff drew maps that were then issued in a separate volume titled *The War in Maps* (1942). Herlin frequently used the orthographic projection, which portrayed the territory from a point of distance, so that the curvature of the earth would help to portray the sweep of the oceans and deliver a sense of movement over the horizon and the power of a world organized through aviation. Other

newspapers notable for contributions to journalistic cartography were the *Christian Science Monitor*, *Chicago Tribune*, *New York Herald-Tribune*, *New York Daily News*, and *Milwaukee Journal*, each of which had cartographers on their staff who could devote themselves to mapping the war for the general public (Ristow 1957, 370). None of these were trained as cartographers, yet their work was tremendously influential in educating the public in the new geographical relationships spawned by war and aviation.

One of the few professional geographers to contribute to journalistic cartography was Erwin Raisz. Other noted contributors include H. C. Detje—who drew for the newspaper *PM* and later for the Associated Press (AP), where he won a Pulitzer Prize for his

cartography—and Antonio Petrucelli, who continued to work into the 1950s, when he collaborated with Harrison on the significant “This Troubled World” series of maps for the *St. Louis Post-Dispatch* of 12 September 1954. According to Walter W. Ristow, the most important advances in the genre of journalistic cartography were made in weekly magazines, where the deadlines, variety of themes, and latitude in the use of color encouraged this particular talent to thrive. Two of the most important subjects to drive interest in journalistic cartography were those that drove interest in geography more generally: travel and international conflict. Travel maps appeared in *Better Homes and Gardens*, *Holiday*, *Life*, *Look*, and the *Saturday Evening Post* (Ristow 1957, 371–74).

These cartographers incorporated style and drama into the news map but also restored a connection between the map and the place it depicted. Midcentury journalistic cartography visualized topography in a graphic—occasionally exaggerated—manner, incorporating onto the map itself elements of the terrain to drive home to the viewer the “reality” of the landscape. Paradoxically, these maps appeared both familiar and unfamiliar. They were familiar in giving intuitive views from the air or incorporating recognizable landscapes and landmarks into the map. But they were unfamiliar insofar as they challenged conventional ideas of direction (placing the North Pole at the center or approaching Europe from the east), distance (shrinking space in order to convey the degree to which aviation had collapsed concepts of distance), and relationships (visualizing the land from above, exaggerating the landforms in order to illustrate the realities of geopolitics). Their achievement was remarkable, if temporary, as reflected by the sharp drop in maps after the conclusion of the war (Kent and Sanders 1993, 95–96).

If World War II was an important catalyst for journalistic cartography, the early Cold War also drove both interest and experimentalism in the genre. One of the pillars of this midcentury phase was Robert M. Chapin, who dominated the cartographic work done at *Time* magazine and established a pattern and style that would become customary for modern journalistic cartography (Ristow 1957, 384–88). *Time* was itself a relatively new magazine, designed to digest the news into a weekly format for those too busy to read the daily paper. In such a venue, the reliance on photographs and maps to deliver this news seemed eminently appropriate. World War II had tremendously boosted *Time*'s circulation, while its strong anti-Communist history meant the magazine continued to foreground the Cold War into the 1950s. Chapin's strong reputation at the magazine gave him wide latitude to experiment with politically charged maps that stressed the Soviet threat. To this end he relied

greatly on the use of airbrush techniques and icons such as pincers, clamps, and sickles that rendered the struggle against the Soviet Union and international communism even more urgent (Diviak 1999).

Consider, for instance, Chapin's *Eurasian Heartland* map from 1947 (fig. 432). This map adapted the worldview advanced by Halford John Mackinder at the turn of the century. Mackinder's 1904 map of *The Natural Seats of Power* (see fig. 323) argued that the Russian landmass was the “pivot area” of the world, the central seat of international power where both defensive and offensive strategies could be launched. Mackinder's thesis enjoyed great vogue once again during and after World War II as an explanation for the designs of the Nazis and then the Soviets. In *Eurasian Heartland*, Chapin updates Mackinder's picture of geopolitics in order to demonstrate the Soviet seat of power and the logic behind its expansive strategies. Chapin forces the reader to see the world from a Soviet-centered view, which dislocates traditional understandings of Europe.

Similarly, Chapin's *Design for Defense* of 1949 posits a Soviet Union with designs on Western Europe and uses color and orientation to picture zones of containment and resistance in both Scandinavia and the Mediterranean (fig. 433). Among the more modest examples of Chapin's stylized use of scale, color, and iconography to mobilize the public at the height of the Cold War, these maps helped to create consensus about Soviet expansion and aggression as well as the relative benignity of American foreign policy. The Smith-Mundt Act of 1948 abetted this politicization of the national news by rallying editors and owners of the news media to anti-Communism. With this act, the Truman administration established official government news agents as international news contacts, so that the federal government effectively became a major source of international news (Stone 2007).

The growth of television also shaped journalistic cartography and sparked innovations in newspaper publishing more generally. According to Mark Monmonier, the most fundamental change in this respect was the replacement of manually operated machines with computer generated cold type, or photocomposition. Such a change shifted production of maps to layout boards and positive paper-copy images, which facilitated last-minute changes that could accommodate a more rapid news cycle. It also allowed for greater flexibility in layout, which eventually meant a shift from vertical to horizontal layout of the news in the 1970s (Monmonier 1989, 47–48). By the 1980s, newspaper maps began to cover domestic news, and the expansion and sectionalization of papers encouraged a shift from the dramatic, large maps of midcentury toward smaller (usually one-column) maps. Other developments—both technological and journalis-

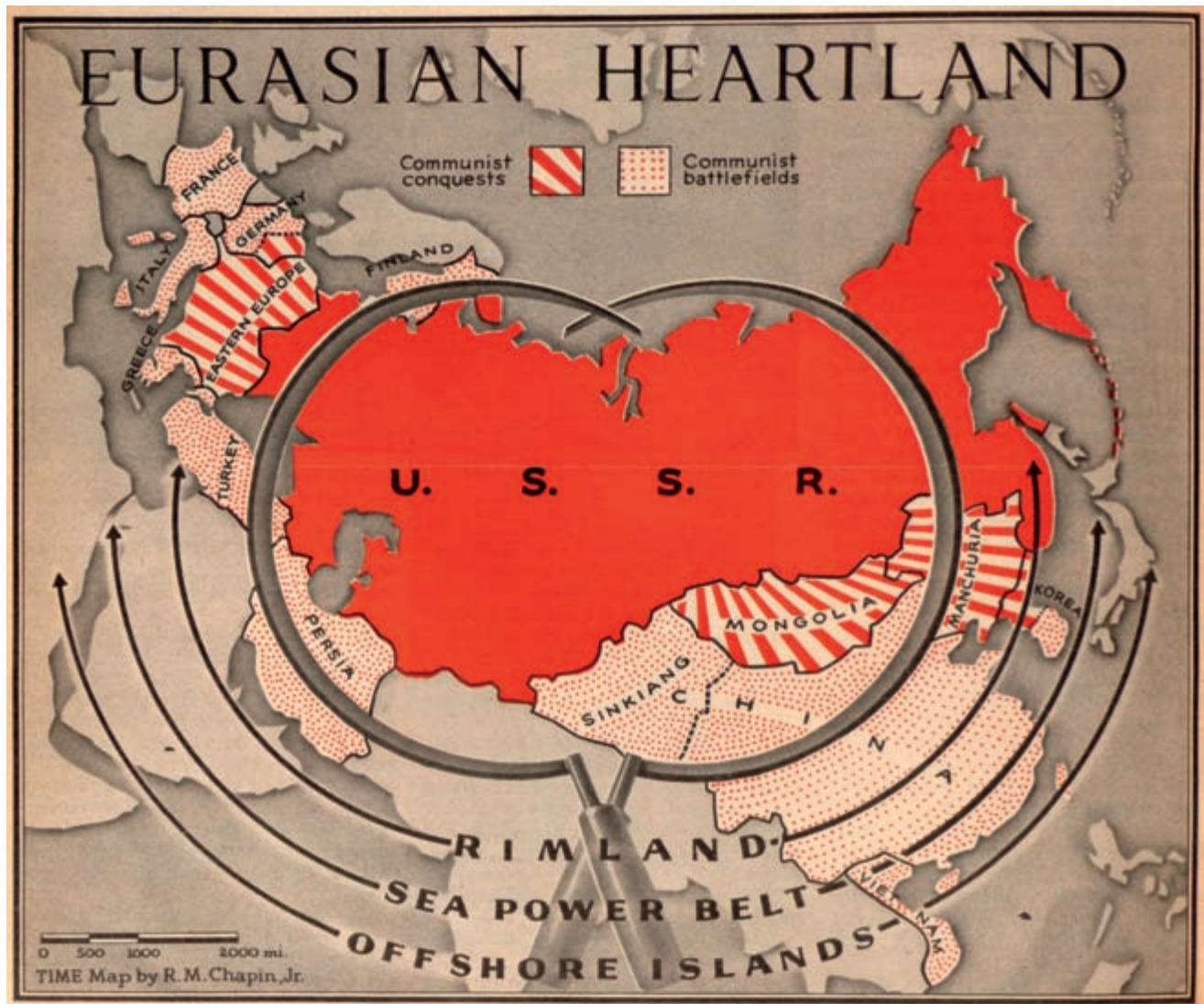


FIG. 432. ROBERT M. CHAPIN, *EURASIAN HEARTLAND*, 1947.

Size of the original: 15.3 × 18.3 cm. From *Time* 50, 22 September 1947, 28.

tic—also shaped the growth of journalistic cartography. The AP's Wirephoto service and other graphics syndicates enabled small and local dailies to use maps by the middle of the century, although the maps provided by these outlets were generally less sophisticated than those produced by in-house cartographic departments at larger newspapers. After 1960, the rise of offset printing and photocomposition made newspapers less dependent on these services, yet they had much to do with the marked increase in map use within local newspapers in recent decades. Perhaps the most important technical development was the arrival of Apple Macintosh computers in 1984, which further simplified and democratized the creation of maps. Journalistically, the launch of *USA Today* in 1982 forced other newspapers to compete with its

emphasis on visuals, which in turn fed the use of news maps. At the same time, editors gradually expanded the scope of news that could be treated cartographically.

In Britain, the 1990s witnessed a general rise in maps of “new Europe” as part of a broader debate about the direction of Europe in the aftermath of the Cold War. These maps, according to Peter Vujakovic (1999), were in part establishing new European identities and in part reflected the growing anxiety among Western European elites about the changing composition of Europe. For instance, in the early 1990s many British maps depicted Western Europe as a stronghold against the influences associated with the East, whether in the form of barbarism, Islam, or Soviet Communism. The particularly problematic zone of Eastern Europe was placed in con-



FIG. 433. ROBERT M. CHAPIN, *DESIGN FOR DEFENSE*, 1949.

Size of the original: 11.1 × 12.1 cm. From *Time* 54, 1 August 1949, 16.

trast to the relative stability of the European Community and the European Free Trade Area.

The first Gulf War saw the proliferation of television maps, though the use of maps dropped off significantly once footage from the war itself became available. During the buildup to the war, print media emphasized general-information maps. During the air war, media map coverage reached a peak, with most publications carrying updates on a daily or weekly basis and maps speculating upon the impending ground war. The aftermath of the war brought some of the most detailed cartography, including city and highway maps (Clarke 1992).

Considering the century as a whole, a few overarching trends are apparent. First, there have been a few periods of significant increase in the use and appearance of news maps: between 1930 and 1940 the increase was attributable both to international turmoil but also to the simple initiation of the AP Wirephoto network in 1935, which facilitated access to maps by midsized newspapers *without* staff cartographers. A sharp drop-off of journalistic maps in 1945 is almost entirely attributable to the end of the war. Between 1955 and 1960, we see some sharp rises related to the Cold War and rising interest in travel, but also significant reversals that perhaps relate to the quiet periods of the Soviet-American standoff (Monmonier 1989, 54). Since the 1980s many of the factors mentioned above have contributed to the growing use of maps, including technological ease of use, the expansion of types of stories illustrated by cartography, and the

competition engendered by *USA Today*. As Monmonier has written, maps have become a way for newspapers to compete for the reader's attention, split by a proliferation of media at the turn of the twenty-first century (Monmonier 2001, 50).

SUSAN SCHULTEN

SEE ALSO: Color and Cartography; Harrison, Richard Edes; Narrative and Cartography; Political Cartoons, Maps as; Reproduction of Maps: The Reproduction of Maps by Printing; Television and Maps; Weather Map; Web Cartography

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Journals, Cartographic. For the purposes of this entry, cartographic journals are defined as regularly issued periodicals containing scholarly articles on cartography. Newsletters are valuable current-awareness periodical publications; they tend to be issued by professional organizations and have the communication of timely information as their main goal. They generally contain lists of new publications, jobs available, updates from officers of associations, new members, grants availability and deadlines, grants received, and news relating to the organization.

Specifically not included are monograph series, such as: cartobibliographies issued by the Map Collectors' Circle; conference proceedings, such as those of ESRI (Environmental Systems Research Institute), Auto-Carto, and the International Cartographic Association; and geographic and other journals that occasionally carry articles on cartography. While the latter are excluded because of their large number, *Petermanns Geographische Mitteilungen* (1855–2004) must be mentioned insofar as it contains a very large number of maps and articles about maps. Indeed, a list of maps contained in *Petermanns* only from 1855 to 1945 fills nearly 600 pages (Smits 2004).

Several salient trends may be discerned. (1) Cartographic journals reflect not only the emergence of cartography as a distinct discipline (Wolter 1973, 1975) but also the existence and evolution of key research foci. (2) The number of cartographic periodicals increased from the 1950s through to approximately the end of the 1980s, after which the number of active journals held steady. (3) Although cartographic journals were most often produced by professional and scholarly societies, they were occasionally issued by commercial firms, with the latter mode more common in the last two decades of the century. In the 1980s and 1990s and on into the twenty-first century some professional associations chose to have their journals issued in print and online by commercial firms such as John Wiley and the Taylor & Francis Group. (4) Changes in titles as well as the demise of some journals and the appearance of new ones mirror significant changes in the field of cartography, albeit generally with some years of lag time. Prominent changes reflect the move from research on aerial photography to the extensive literature on images collected by sensors on satellites, most often in digital form and starting in the early 1970s, as well as the in-

creasing importance of what started as automated cartography and morphed into geographical information systems (GIS), with the term later changing from geographic information systems to geographic information science (GISci). For example, the *American Cartographer*, which began publication in 1974, became *Cartography and Geographic Information Systems* in 1990, and *Cartography and Geographic Information Science* in 1999. (5) The number of subscribers varied markedly from title to title. By the early twenty-first century, circulation ranged from the low hundreds (e.g., 433 for *Cartographica*) to the low thousands (e.g., 2,000 for the *Cartographic Journal*, 2,950 for *Cartography and Geographic Information Science*, and 3,260 for *Kartographische Nachrichten*) (Ulrich's 2009). (6) Starting in the late 1990s, many journals began publishing full-text versions online, and by the end of the century some periodicals—especially newsletters—were available only online, without hard copy issues. This trend stems from the submission of papers as electronic files, most notably starting in the late 1980s, when word processing software had become widespread, and from the emergence of the Internet and the World Wide Web soon thereafter. Full-text articles became available, often for a fee, in the late 1990s, and many journals developed electronic backfiles by scanning hard copy issues not produced by digital prepress technology. The not-for-profit service JSTOR (short for "journal storage" and founded in 1995) was a pioneer in the electronic archiving of scholarly journals and other scholarly literature; commercial publishers were quick to recognize the profits to be earned by leasing their backfiles to research libraries and selling individual articles to nonsubscribers for what were at the time substantial fees—\$30 or more in some cases. (7) The first decade of the twenty-first century saw the emergence of journals published online only and available free to all Internet users. Noteworthy examples are the *Journal of Maps* and *Coordinates*, both initiated in 2005.

Although scholarly journals of geography date back to the nineteenth century, the beginning and growth of cartographic journals were twentieth-century phenomena, with major growth occurring in the second half of the century (Harris and Fellmann 1980, 7; Stephens 1980, 123). The first journal of cartography that lasted more than a few issues was *Globen*, introduced in 1922 by the Swedish cartographic society, Kartografiska sällskapet. It was not until 1951 that another cartographic society, the Deutsche Gesellschaft für Kartographie, launched the second journal, *Kartographische Nachrichten*. This marked the start of rapid growth in the number of cartographic journals, with more than thirty-five cartographic journals being published between 1951 and 1975 (Stephens 1980, 123). Some years even saw the be-

gining of more than one journal. For example, in 1958 both *Kartografie* (superseded in 1975 by *Kartografisch Tijdschrift*) and the *Bulletin* of the Comité français de cartographie published their first issues (Stephens 1980, 123). The French *Bulletin* provides a classic case of name changing; it began as the *Bulletin du Comité français de techniques cartographiques*, changed its name in 1962 to *Bulletin du Comité français de cartographie*, and ceased publication in 2001, ceding its mission to a new title, *Le Monde des cartes: Revue du Comité français de cartographie*, started in 2002.

In a 1980 survey of then-current cartographic serials, John D. Stephens counted sixty-seven titles, but his list includes irregular serials in cartography and titles of other serials that regularly published cartographic literature. When titles in these latter two categories are subtracted, there were fifty-four journals of cartography, including journals with a title that includes both *cartography* and the name of an allied subject, most often geodesy or surveying (128–38). An international conference on the role of cartographic journals in a world of changing technology, held in Warsaw on 24–26 April 1979, is further evidence of this substantial activity in the publication of cartographic journals (Freitag 1979). This activity attests to the international nature of research in cartography, especially in North America, Western Europe, the former Soviet Union, Australia, and New Zealand. A particularly revealing example is a journal that, under its first three titles, published translations of articles on cartographic research originally published in the former Soviet Union and Eastern Europe. It began as *Geodesy and Aerophotography* in 1962 but changed its name to *Geodesy, Mapping, and Photogrammetry* in 1973, to *Mapping Sciences and Remote Sensing* in 1984, and to *GIScience and Remote Sensing* in 2004. By the mid-1980s, there were about fifty cartographic and cartographic-geodetic journals, and the “extremely energetic and diverse development” of cartographic journals was noted and documented by the eminent Soviet cartographer Konstantin Alekseyevich Salishchev ([1986?], 99; Zögner 1988–89).

In the last decades of the twentieth century, several journals achieved milestones in the number of years of publication (e.g., *Kartographische Nachrichten*, *Cartographic Journal*, *Imago Mundi*, *Geodeziya i Kartografiya*, 地图 *Chizu/Map*, *Der Globusfreund*), and some were memorialized by brief articles in the nature of historical overviews. *Bibliographia Cartographica* (*Bibliotheca Cartographica*, 1957–72; issued under the new title in 1974; beta version online since ca. 2006) is of considerable assistance to the researcher seeking articles published in the main journals of cartography as well as geography journals that frequently publish articles on cartography. It is especially valuable because it has

indexed journals rarely covered by other periodical indexes and journals not elsewhere indexed.

A detailed analysis of 920 articles appearing in *Cartographica*, the *Cartographic Journal*, and the *American Cartographer* from 1964 through 1989 showed three major research areas—automated cartography, historical topics, and user-oriented studies—as accounting for nearly half of the articles, with the number of articles in automated cartography increasing sharply while articles on other topics either decreased or stayed at approximately the same level (Gilmartin 1992, 44). The total number of citations appearing in *Bibliographia Cartographica* from 1957–71 and 1974–88 was not far from 100,000, and the categories of thematic, theoretical, history, topographic, and technology accounted for the largest numbers of articles (Gilmartin 1992, 44, 45).

Over the years numerous periodicals ceased publication, most notably *Bibliographie cartographique internationale* (1946–79), the Royal Geographical Society’s *New Geographical Literature and Maps* (1951–80), *Cartactual* (1965–93), *International Yearbook of Cartography* (1961–90), *World Cartography* (1951–93), the *Map Collector* (1977–96), and *Mercator’s World* (1996–2003). But new journals and newsletters emerged, including 地图 *Ditu* (Map) (1986), *Cartographic Perspectives* (1989–), the *NEMO Newsletter* of the North East Map Organization (1990–), the *Journal*, Israel Map Collectors Society (commenced in 1986), and the *Newsletter*, Philip Lee Phillips Society (1996–).

Beginning in the late 1980s, several commercial firms introduced journals that were offered free to potential buyers of equipment and data sold by advertisers. In many cases these periodicals had more complicated publication histories than other cartographic journals with frequent title changes and short lifespans, to the point where records in *Ulrich’s Periodicals Directory*, a standard reference, do not necessarily agree with those found in library online catalogs as to what title was used when. Although these journals often, but not always, had a provision whereby readers unlikely to purchase materials sold by the advertisers had to pay for their subscription, circulation tended to be much higher than for other cartographic journals. Notable examples are listed in table 31.

By the early 2000s, and even in the late 1990s, it was common for cartographic journals to be available in digital form over the Internet, very often for a fee or subscription or as a privilege of membership in a professional society (Kowalski 2002). Libraries that had begun in the mid-1990s to provide online access to indexes to periodical articles as a matter of course worked to provide patrons access to full-text articles whenever periodical publishers extended that service to subscribers, including library subscribers. By the late 2000s the

TABLE 31. Cartographic journals introduced by commercial firms

Years	Latest/Last title	Previous titles	Subscriptions
1987–99	<i>Mapping Awareness</i>	<i>Mapping Awareness and GIS in Europe</i> (until 1993)	1,850 paid subscriptions and 5,750 free subscriptions
1988–	<i>Geo World</i>	<i>GIS World</i> (until 1998)	25,050 subscriptions
1990–2006	<i>Geospatial Solutions: Applications of GIS and Related Spatial Information Technologies</i>	<i>Geo Info Systems</i> (1990–2000); <i>Geospatial Solutions</i> (2000–2006)	27,045 subscriptions
1992–	<i>GEO: GEOconnexion International Magazine</i>	<i>GIS Europe: Europe's Geographic Information Systems Magazine</i> (through 1998); <i>GeoEurope</i> (1999–2000); and <i>GEO Connexion</i> (through 2005)	46,000 subscriptions

number of cartographic journals was still around fifty titles (Ulrich's 2001–; accessed 19 May 2009). A search of the Library of Congress online catalog on 10 June 2009 (using the dual subject keywords “cartography” and “periodicals”) not only attested to the wide geographic distribution of countries in which cartographic journals were published but also provided an estimate—approximately 180 titles—of the total number of all cartographic journals ever published over the years, based on cartographic journals collected by the largest library in the United States, also the country's de facto national library. There were 100 entries alone for the subject heading “Cartography–Periodicals.” Moreover, for thirty-five countries, the catalog included a subject heading with the pattern “Cartography–[country name]–Periodicals.” The United States had seventeen titles, Canada and Germany had four. Countries with three titles were: China, France, Great Britain, Hungary, Japan, and Ukraine; those with two: Algeria, Australia, Brazil, Finland, India, Italy, Lithuania, Mexico, New Zealand, Panama, and Philippines; and those with one: Austria, Democratic Republic of the Congo, Honduras, Indonesia, Iran, South Korea, Netherlands, Nigeria, Norway, Poland, Slovakia, Spain, Sweden, Switzerland, and Thailand.

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SEE ALSO: *American Cartographer*, *The*; *Cartographic Journal*, *The*; *Cartographica*; Electronic Cartography: (1) Conferences on Computer-Aided Mapping in North America and Europe, (2) Conferences on Computer-Aided Mapping in Latin America; *Imago Mundi*; *International Journal for Geographical Information Systems/Science*; *Kartographische Nachrichten*; *Petermanns Geographische Mitteilungen*; Societies, Geographical

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Justus Perthes (Germany). In September 1785 Justus Perthes established a publishing firm in Gotha, a residence town in one of the small duchies of Thuringia, in central Germany. The family-run business owed its early reputation and economic success to its yearbooks, *Almanach de Gotha* (French ed.) and *Gothaischer Genealogischer Hofkalender* (German ed.), published from 1763 to 1942 as the de facto official registry of German nobility, and thus comparable to Britain's *Burke's Peerage and Gentry*. Amid the Napoleonic changes to the map of Europe, which coincided with a growing interest in exploration and travel literature and an ever-increasing amount of topographic data, the firm gradually expanded its scope to include geography and cartography (fig. 434).



FIG. 434. THE SO-CALLED ANCESTOR'S GALLERY. The view is at Justus Perthes' Geographischer Anstalt shortly after 1900 with map cases for single sheets of drafts, test prints, and offprints of the map collection. Together with the archive and library, the map collection now is housed at the Forschungsbibliothek Gotha in Friedenstein Castle. Image courtesy of the Forschungsbibliothek Gotha, Sammlung Perthes Archiv.

The most significant publication marking this transition was Adolf Stieler's *Hand-Atlas über alle Theile der Erde und über das Weltgebäude* (1st ed., 1817–23, 50 sheets), which inaugurated what became known as the Gotha School, characterized by an exclusive reliance on verified data, the courage to concede uncertainty rather than print questionable details, and the meticulous documentation of all sources. Frequently updated and expanded, Stieler's *Handatlas* embodied carefully chosen map projections, comparable scales, and great detail based on highly reliable sources. The ninth edition (1900–1905, 100 sheets), for which lithography replaced copperplate printing, epitomized the company's leadership in atlas production. The tenth edition (1920–25, 108 sheets with 254 map units, and a register of 320,000 place-names), also called the centenary edition, introduced blue hydrographic detail within the traditional ocean blue area tints but was difficult to read because of dark terrain coloring that was much too heavily printed. In addition to the economic hardship brought about by World War I, the firm faced stiff competition from innovative domestic competitors, most notably Velhagen & Klasing, which relied on a larger format, better typography, and a more balanced map design to capture an increased share of the market for Richard Andree's *Allgemeiner Handatlas*. In 1934 the Perthes firm began work on its ambitious international edition, Stieler's *Grand Atlas de Géographie moderne*, which was based on the tenth edition but presented each country's toponymy in its own local language; the

project was aborted in 1940 although 85 of the planned 114 sheets were ready for printing. Another casualty of World War II was Stieler's *Handatlas*: with an impressive record of 112 near-annual prints between 1817 and 1944, it was synonymous with German leadership in atlas cartography. Next to Stieler's *Handatlas*, the journal *Petermanns Geographische Mitteilungen* (1855–2004) was the most influential and longest-selling product of the enterprise, which by the 1850s had officially changed its name to Justus Perthes' Geographische Anstalt.

The company entered the twentieth century with ten highly trained cartographers under fourth-generation publisher Bernhard Perthes. Despite these human assets, unsurpassed in any contemporary private establishment, the firm was handicapped by obsolete technology and challenged by more efficient competitors. One of these increasingly outdated production methods was the copperplate engraving and costly hand coloring of Carl Vogel's masterful small-scale cartography and relief representation of his 100-sheet, 1:500,000 map series of the German Empire, *Karte des Deutschen Reiches*, introduced in 1891 and revised and printed into the early years of World War II. To survive, Perthes needed to replace copperplate printing and hand coloring with multicolor lithography and also drop or redesign numerous well-established but increasingly old-fashioned and unprofitable products.

Especially in the crucial sector of educational cartography Hermann Haack, who had studied for his doctorate in geography at the University of Göttingen under Hermann Wagner with financial support from Bernhard Perthes, proved to be the much-needed innovation leader. When Haack joined Justus Perthes in 1897, the company offered a full but aging line of educational atlases for domestic and foreign school markets, most notably Emil von Sydow's *Schulatlas* (1849–87, thirty-nine editions, with annual sales peaking at about 60,000 copies in the 1870s), Hermann Wagner's *Sydow-Wagner Methodischer Schul-Atlas* (1888–1944, twenty-three editions) (fig. 435), and Hermann Habenicht's *Elementar-Atlas* (1882–84, five editions), and a prominent line of school wall maps. Haack injected much-needed vigor and innovation into atlas cartography and quickly became the company's most eminent cartographer. He contributed to the ninth edition of Stieler's *Handatlas* and supervised the design and production of the tenth edition as well as the firm's school atlases and wall maps (fig. 436).

Haack also excelled as an editor and educational leader. In 1902, he took over the *Geographischer Anzeiger* (1899–1944) three years after the firm had introduced it as an advertising periodical. Haack developed *Geographischer Anzeiger* into the leading German publication for geography teachers, and it became the house



FIG. 435. DETAIL OF THE MAP *ITALIA* WITH INSETS. Inset maps in “post stamp cartography style,” including a thematic example, from *Sydow-Wagner Methodischer Schul-Atlas*, rev. enl. ed., ed. Hermann Wagner (Gotha: Justus Perthes, 1923), map 27.

Size of the entire original: ca. 28.8 × 32.8 cm; size of detail: ca. 20.3 × 28.4 cm. Image courtesy of the Forschungsbibliothek Gotha, Sammlung Perthes Archiv (4° 329).

organ of the Verband Deutscher Schulgeographen, the geography teachers association, which he founded in 1911. Within three years the association had 3,000 members, who were not only automatic subscribers but also potential Justus Perthes customers—a ready audience when Haack published several articles explaining the conceptual basis for three new series of visually balanced and highly legible “wall atlases”: *Großer Geographischer Wandatlas* (1907 ff.), *Großer Historischer Wandatlas* (1912 ff.), and *Physikalischer Wandatlas* (1913 ff.). Because Haack had chosen loud colors, the new Justus Perthes wall maps could be read even from the back row in a classroom.

Since 1919 the fifth-generation publisher Joachim Perthes was confronted with the firm’s greatest challenges: World War I had cost the firm many employees and delayed the tenth edition of Stieler’s *Handatlas*. The postwar economic crisis of the early 1920s was swiftly

followed by the Great Depression of the 1930s, World War II, and the Soviet occupation of the part of Germany where the company was located. These adverse circumstances allowed few new cartographic projects, the most prominent of which was the *Fliegerkarte* for the Luftwaffe, printed since 1935 and based on Vogel’s *Karte des Deutschen Reiches*. In 1943, Haack retired at age seventy-one, not suspecting that after Germany’s defeat in 1945 the firm’s fate would rest largely on his cartographic authority, command of the Russian language, and untarnished political reputation—all key factors in the Soviet Union’s decision to keep Justus Perthes afloat. Before retiring for the second and final time, Haack rescued *Petermanns Geographische Mitteilungen* by serving as its editor during its relaunch period, from 1948 to 1954. Although reprints dominated the Justus Perthes product line through the mid-1950s, the firm met postwar education needs by introducing Fritz Haefke and

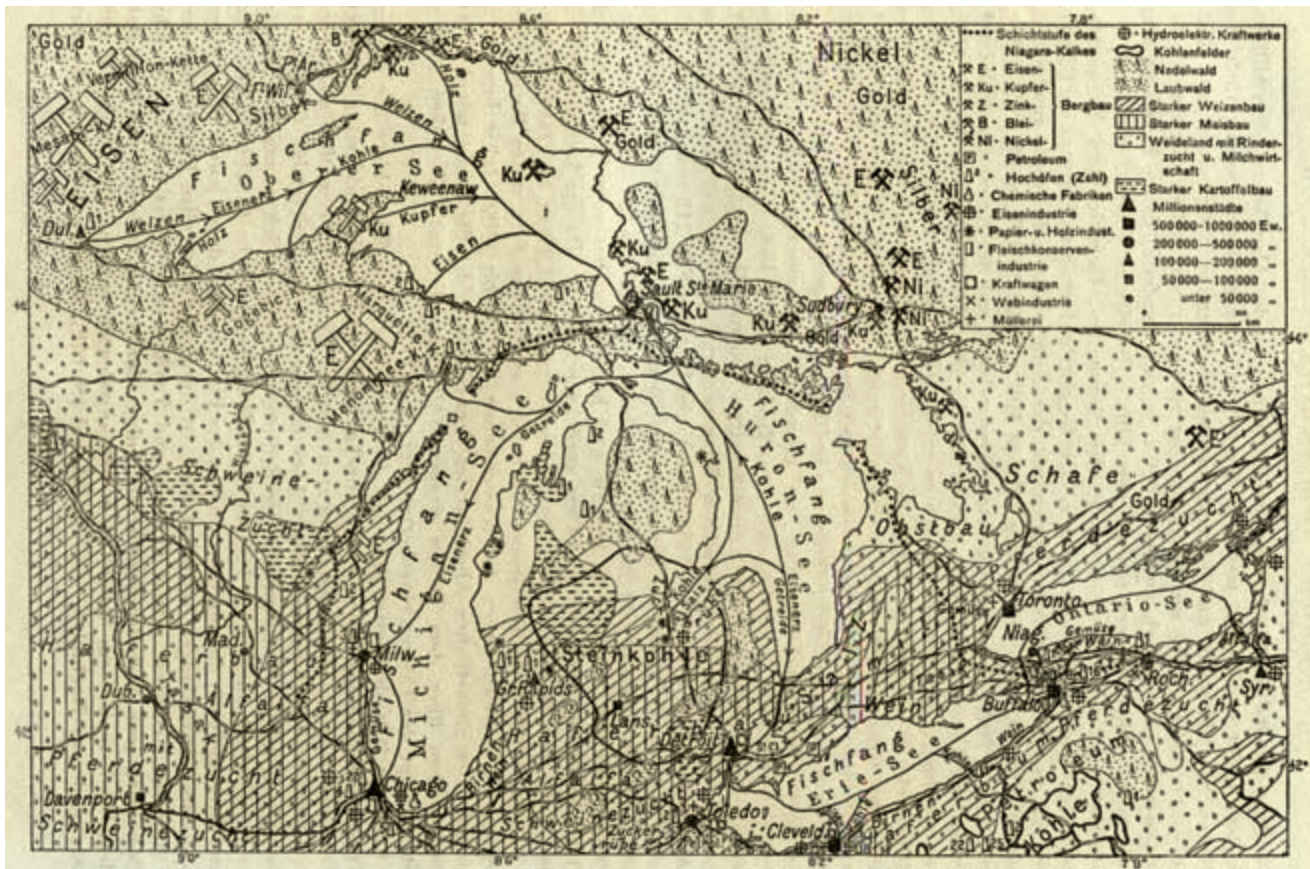


FIG. 436. ECONOMIC MAP FROM *LAENDERKUNDE*. Hermann Lautensach's handbook, a supplement reader with thematic maps to the tenth edition of the topographic Stieler's *Handatlas*, included this innovative economic mapping of the Great Lakes in North America.

Size of the original: 12.8 × 19.5 cm. From Hermann Lautensach, *Laenderkunde: Ein Handbuch zum Stieler*, 2 vols. (Gotha: Justus Perthes, 1926), 2:694 (fig. 118).

Herbert Heyde's *Kleiner Volksatlas* (1947) and its enlarged version *Atlas zur Erd- und Länderkunde* (1949).

Partition of the country into East and West Germany in 1949 made it impossible to continue Justus Perthes as a private enterprise in Gotha. The Perthes family fled to West Germany in December 1952, and East Germany expropriated the company in January 1953 and converted it into the state-owned VEB Geographisch-Kartographische Anstalt Gotha (1953–92). This state-run entity became the sole publisher of educational cartographic material in East Germany—a natural monopoly insofar as Allied bombing of the German publishing hub at Leipzig in 1944 had wiped out long-time competitors such as Velhagen & Klasing and Wagner & Debes. In October 1955 the name was changed to VEB Hermann Haack Geographisch-Kartographische Anstalt Gotha to honor the most reputable cartographer in East Germany.

Instead of reviving Stieler's *Handatlas*, VEB Hermann Haack published *Haack Großer Weltatlas* (1964–69)

under the trademark Haack-Gotha, and issued updated supplements in 1970, 1971, and 1978. Among derivative foreign-language editions was a Spanish version for Cuba. The atlas survived into the twenty-first century with many editions tailor-made for German federal states and different school grades and supplemented by additional material for teachers and students. (For example, the 2009 edition of *Haack Weltatlas Digital* contained 510 maps and graphs for slide projection.) Most notable among the firm's other products—and making up roughly half of VEB Hermann Haack's sales volume—were thematic atlases like *Atlas zur Weltgeschichte* (2 vols., 1973–75) and *Atlas der Deutschen Demokratischen Republik* (installments 1976–88), the national atlas of East Germany, compiled in cooperation with East Germany's Deutsche Akademie der Wissenschaften (fig. 437).

In West Germany, the Perthes family resettled in Darmstadt and continued publishing as Geographische Verlagsanstalt Justus Perthes Darmstadt (1953–92), re-

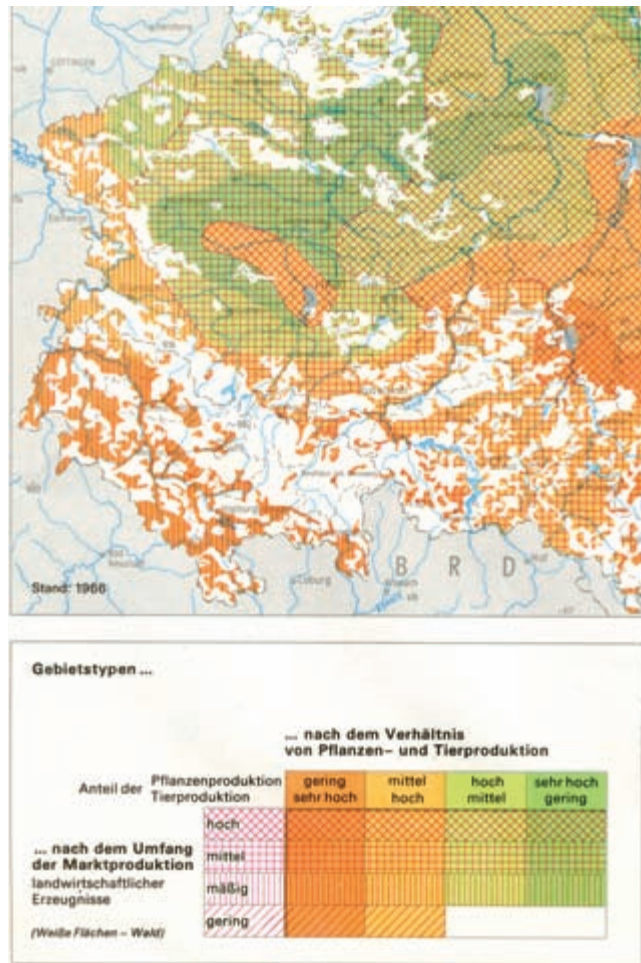


FIG. 437. DETAIL OF A COMPLEX THEMATIC MAP ON MARKET PRODUCTION. *Marktproduktion: Umfang der Marktproduktion in Beziehung zum Verhältnis von Pflanzen- und Tierproduktion*, in *Atlas: Deutsche Demokratische Republik*, 2 vols. (Gotha: VEB Hermann Haack, 1976–81), 2:40.1.

Size of the original: 39.9 × 24.2 cm; size of detail: 17.8 × 11.9 cm. © Ernst Klett Verlag GmbH, Zweigniederlassung Gotha.

lying initially on a few loyal emigrant employees who also had moved from East to West. Under the cartographic leadership of Werner Painke, once an apprentice of Haack and in the company's service from 1939 to 1983, the Darmstadt operation also catered to the education market by printing over 100 new or revised wall maps in various language editions, over 200 sets of overhead transparencies, and numerous 35 millimeter slide series, all aimed at teaching geography and history.

As a result of German reunification in 1990, VEB Hermann Haack was returned to the seventh-generation publisher (since 1980) Stephan Perthes in March 1992. Facing a highly competitive market environment and

lacking the resources to upgrade the neglected Gotha premises, the final publisher from the Perthes family sold both companies in April 1992 to Ernst Klett Schulbuchverlag, a large Stuttgart-based publishing group focused on the education market. In 1995 the Klett firm consolidated its cartographic entities in Gotha, Darmstadt, and Stuttgart—this last contributed *Alexander Schulatlas* and *Klett Länderkunden*—under the name Justus Perthes Gotha, and all activities in geography and cartography were centralized in Gotha until 1998. The product catalog included educational materials like Klett's *Alexander Schulatlas* customized for various German states as well as grade levels (from elementary through high school to the university), wall and single-sheet maps, scholarly books, and the Perthes flagship journal, *Petermanns Geographische Mitteilungen*.

Market conditions and management decisions precipitated further decline of Justus Perthes as a distinct, independent entity. The business was renamed Klett-Perthes Verlag in 2003, *Petermanns Geographische Mitteilungen* was discontinued in 2004, and educational activities were transferred to Leipzig in 2005. The final blow came in July 2008, when the activities remaining in Gotha were restructured and renamed Ernst Klett Verlag, Zweigniederlassung Gotha, Gymnasialverlag, Programmbereich Klett-Perthes. Although this extinguished the trade name Justus Perthes after 222 years in business, the survival of the company's history was assured on 1 January 2003, when Stephan Perthes sold the Justus Perthes' map collection, library, and archives (Sammlung Perthes Gotha) to the German state of Thuringia for €6.4 million. Subsequently, these collections, consisting of an estimated 185,000 maps, 120,000 books and journal volumes, and 800 running meters of company documents, which include correspondence with luminaries from Alexander von Humboldt to Sven Anders Hedin, were given to the University of Erfurt, which housed them as part of its Forschungsbibliothek Gotha in the Friedenstein Castle, overlooking the town and former premises of Justus Perthes.

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SEE ALSO: Atlas: (1) Thematic Atlas, (2) World Atlas; Marketing of Maps, Mass; Road Mapping: Europe; Wall Map; Wayfinding and Travel Maps: Indexed Street Map

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