Ottosson, Torgny (1988). What does it take to read a map? *Scientific Journal of Orienteering*, 4, 97–106.
reviewed by Jeremy Crampton, Penn State University

Can children understand maps "early and easily," or do they find maps difficult, not at all "transparent"? This is the main question addressed by Ottosson in his review of a brief selection of literature on the topic. And it is certainly an important question in this time of geographic ignorance. If children readily understand maps, geographic education need not devote much effort to them, and could possibly even ignore them. On the other hand, if map understanding is an effortful process, explicit formal training may be necessary.

Ottosson largely accepts the former position. Since "most spatial relationships on many maps are the same as the relationships between the corresponding real-world features" (p. 101), it is possible for children to have a basic understanding of maps. A large number of his references are from the Sheffield Research Program (UK), one conclusion of which is that young children can easily use maps.

However, this kind of position has been repeatedly criticized. Piagetian as well as cartographic theory would argue that map understanding does *not* come "early and easily." There are also empirical problems with such arguments. Ottosson appears to be aware of these criticisms, but rather too easily dismisses them (in a single sentence) before going on to make the assertion quoted above. The trouble with this position is that it merely pushes the problem backwards; instead of striving to understand how children comprehend maps, the task instead is to understand spatial comprehension of the environment (skills which are then somehow applied to map comprehension). Environmental comprehension is a worthy goal, but the overall impression gained from this type of argument is that maps are just reflections of reality that do not involve human creativity or categorization.

Other parts of the article are concerned with showing that map projection (i.e., perspective), symbolization, and scale are not problematic for young children. Ottosson presents some results from an experiment he did involving five year old children who were asked to describe "a rather complex road map." Although there were errors (which seem to reflect the child's reification of symbols, consistent with Piagetian theory), Ottosson nevertheless claims that symbolization is not a crucial problem.

Although there is no doubt that children can learn spatial relations (such as proximity) early on, it is misleading to claim that this means map understanding follows naturally because "in essence . . . map understanding is spatial understanding" (p. 102). It ignores the fact that maps are creative realizations, not degraded pictures of reality. Ottosson's teaching examples depend on showing literal similarities between the environment (a road bend) and the map. This is not necessarily "incorrect," but as he admits himself, it takes attention away from the map's role, it's form and also the active participation of the child.

Miller, David; and Modell, John (1988). Teaching United States history with the Great American History Machine. *Historical Methods*, summer 1988; pp. 121-134.
reviewed by Karl Proehl

The Great American History Machine (GAHM) is a computer-based tool used at Carnegie-Mellon University for interactively accessing and exploring county-level census and election data through a map interface. GAHM was designed as a teaching application to be used for generating and exploring hypotheses rather than for formally testing them.

On the basis of field testing GAHM, the authors belive that this software opens up new possibilities for enabling students to approach historical problems empirically and analytically. A sensible way to use computers in introductory history courses is to facilitate the search for patterns in large bodies of data. GAHM is designed to make data accessible through a medium that invites the search for patterns—the choropleth map.

Six exercises were mentioned along with a series of maps. The authors found that students in this course were much more engaged with the material than is normally the case in introductory history courses.

An excerpt from **Mary Kingsley, *Travels in West Africa***, London: 1897.
Submitted by Pat Gilmartin, University of South Carolina.

Mary Kingsley was an English explorer who explored the Ogowé and Rembé rivers of West Africa in the late 1900's. During her forays there, she collected specimens of fish for the British Museum and continued her father's studies of the religions and laws of primitive societies. She travelled alone, mostly by canoe, hiring native guides along the way. One afternoon, she and her party stopped at a village of the Fan cannibal tribe to ask about villages further upstream. The following is Kingsley's description of the map which the Fans created for them.

"... when we reached a large village on the north bank, we seemed to have a lot of daylight still at hand, and thought it better to stay at [a village] higher up, so as to make a shorter day's work for to-morrow, when we wanted to reach Kondo Kondo; so we went up against the bank just to ask about the situation and character of the up-river villages ... One chief ... took a piece of plantain leaf and tore it up into five different-sized bits. These he laid along the edge of our canoe at different intervals of space, while he told M'bo things, mainly scandalous, about the characters of the villages these bits of leaf represented ... The interval between the bits was proportional to the interval between the villages, and the size of the bits was proportional to the size of the village ...

"Now there is no doubt that that chief's plantain-leaf chart was an ingenious idea and a credit to him. There is also no doubt that the Fan mile is a bit Irish, a matter of nine or so of those of ordinary mortals, but I am bound to say I don't think, even allowing for this, that he put those pieces far enough apart ..."

Schiff, Barry (1989). Aeronautical charts; portraits of the earth. *AOPAPilot*, March, pp. 78–80, 82. *reviewed by Claudette Dellon, Aeronautical Charting Division, NOS/NOAA*

Schiff, a pilot, has written a humorous and touching article on his long-standing love affair with aeronautical charts. He views them as pieces of art, portraits of the earth, with which a pilot can "window-shop the world."

A chart is a map modified for use in aerial or maritime navigation and is meant to work on rather than to look at (though some, like Schiff, like to look as well as to work). To maximize the value of a chart, pilots must learn as much as they can about chart symbology. Schiff feels this can best be accomplished by reviewing the National Oceanic and Atmospheric Administration (NOAA) 112-page booklet, *Aeronautical Chart Users Guide*. To help remember the differences among large- and small-scale charts, he points out that one inch on a VFR terminal area chart (scale 1:250,000), a sectional chart (scale 1:500,000), and a world aeronautical chart, or WAC (scale 1:1,000,000) equals 4, 8, and 16 statute miles respectively.

Covered also is a history of "navigational maps," dating back to 1807 when President Thomas Jefferson established the Survey of the Coast to map our nation's coasts. The Air Commerce Act of 1926 assigned the task of creating charts for air navigation. The first aeronautical chart was published in 1927, the year of Lindbergh's historic flight. By 1930, sectional aeronautical charts were developed to provide coverage for the entire country. Sectionals, at 1:500,000 scale, provide detail needed for visual navigation of slow- to medium-speed aircraft. Those who fly faster and higher don't need as much detail, and this led to the development of regional aeronautical charts (RACs), followed by WACs, and finally, in the 1960's, operational navigation charts (ONCs) published by the Defense Mapping Agency (DMA). RACs, WACs and ONCs are produced at 1:1,000,000 scale.

In 1970 the name of the Survey was changed to NOAA, of which the National Ocean Service (NOS) is charged with publishing and distributing aeronautical charts. Chart products are described in NOS's free catalog, *Aeronautical Charts and Related Products*, available from NOAA Distribution Branch, N/CG33, NOS, Riverdale, MD 20737.

In addition to producing ONCs, DMA produces visual jet navigation charts (JNCs) at 1:2,000,000 scale. Only 122 JNCs are required to cover the entire world, with three covering the continental U.S. The kings of visual charts are the global navigation charts (scale 1:5,000,000') developed for very long range aircraft navigating at very high altitudes. For a free catalog of these and other charts, contact the DMA Combat Support Center, ATTN: PMA, Washington, DC 20315-0020.

Schiff is also fascinated by charts produced by foreign governments. He considers some to be real works of art. The excitement this collector and art lover feels for aeronautical charts is contagious.

cartographic artifacts

ALBUM OF MAP PROJECTIONS

USGS Professional Paper 1453 entitled "An Album of Map Projections" by John Synder and Philip Voxland has been prepared to acquaint those in the cartographic profession with the wide range of map projections that have been developed during the past few centuries. Ninety basic projections are presented with consistent and concise textural descriptions and are accompanied by standarized, visual portrayals.

USGS MAP DISTRIBUTION

The USGS/GPO cooperative map project has been operating for over four years since its inauguration in October 1984. USGS consolidated its eastern and western map distribution facilities into Building 810 in the Denver Center in 1986 in order to realize an annual cost savings of over $1 million. During the consolidation, 3700 tons of maps and books were delivered to Denver in 185 truckloads.

Building 810 offers some seven-