Cartouche

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Bulletin de l'Association canadienne de cartographie

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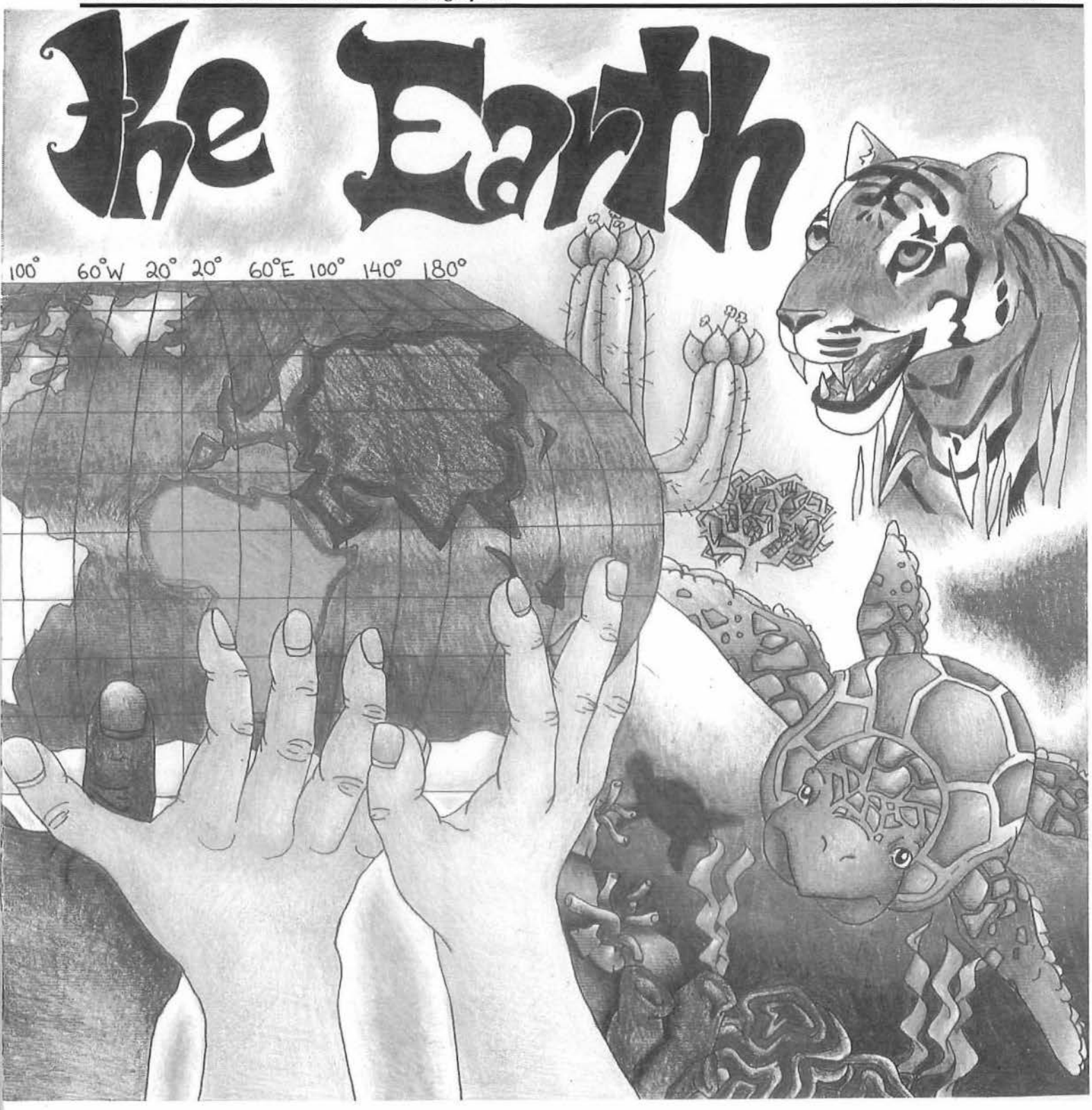

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About the cover...

This issue's cover is a grey-scale reduction of a coloured hand drawn map by Patricia Lan, a 12-year old student from Glenlyon-Norfolk School (Junior Girls Campus) in Victoria, BC. Lan's map titled "Save the Earth" was selected as one of the winners of the 5th International Cartographic Association Barbara Petchenik Children's World Map Competition.

Patricia Lan was presented with a certificate from the International Cartographic Association and a cheque for $50 from the Canadian Cartographic Association during an assembly at her school. This is the first time in the history of this competition that a Canadian map was selected as a winner.

Patricia Lan's map was selected as one of the five Canadian finalists in June 2001. Over 165 maps were received from across Canada (Erin Richmond, curator). The maps of the five finalists were displayed during the CARTO 2001 Conference in Montreal, Quebec, May 30-June 3, 2001, and were then sent to the international competition, held during the 20th International Cartographic Conference in Beijing, China, August 6-10, 2001.

In total, 116 maps from 25 countries were displayed during this international conference. Eight international awards were given as follows: Brazil, Canada, Greece, Hungary, India, Iran, Slovakia, and South Africa. In addition, the public attending the exhibit were given the opportunity to vote for their favourite map. Miss Lan's map was selected as one of the top three public favourites.

The Canadian entries for all the competitions are archived in the Maps, Data, and Government Information Centre at the Carleton University Library, and are available for viewing at http://collections.ic.gc.ca/children/

Inside this issue / *Sommaire....*

FEATURES

COLUMNS and REPORTS

EDITORIAL

Welcome New Members

The CCA would like to welcome the following new members to our organization:

Jason Adam	Toronto, ON
Paul Beullac	Montreal, QC
Martin Dion	Chicoutimi, QC
Laverne Hanley	Chatham, ON
Melinda Hecht-Enns	Kitchener, ON
Steve Kent	Calgary, AB
Jon Leavens	Kitchener, ON
Mark Richardson	Ottawa, ON
Marc-Andre Roy	Montreal, QC
Carlos Serpas	Fribourg, SWITZERLAND
Liesa Stromberg	St Paul, MN USA
Mike Szarmes	Calgary, AB
Catherine Taron	Victoria, BC
Meilani Zamora	Toronto, ON

Shapely Earth: Measuring and Mapping

Donald Fenna Ph.D.
Emeritus Professor of Applied Sciences in Medicine,
University of Alberta

[Excerpts from the Keynote Address, delivered June 1st, 2000 at Carto 2000 in Edmonton. Donald Fenna Ph.D. Emeritus Professor of Applied Sciences in Medicine, University of Alberta, don.fenna@ualberta.ca]

My talk essentially looks backward, through personal experiences that might interest you. As you have heard, my working life spanned from rocket science to teaching cartography, with much other in between. Since retirement, I have completed and had published, by the eminent Amsterdam house Elsevier Science, what is the world's master reference on weights and measures. Written on an historical basis, the 600-page *Elsevier's Encyclopaedic Dictionary of Measures* covers far more cultural than scientific units. It grew, inexorably, from an inquisitiveness concerning trade units met in a course on Historical Geography.

Most of you know that the metre was defined, over 200 years ago, in terms of the size of Earth. It was defined such that 1000 metres would be exactly one hundredth of one hundredth the distance from the Equator to the North Pole. To establish its size, the French measured, very carefully, the distance south from Dunkirk, initially to the Spanish border in the Pyrennes then, repeated, on to the Mediterranean coast near Barcelona. They measured using their extant units, specifically their fathom – the toise – and their lesser units down to the ligne ('line') of a twelfth their inch. As they didn't get identical sizes, they enshrined their new unit, intended to be fully "natural", as a metal bar, just as the English had done for centuries. But they standardized France for the first time, and progressively most of the world. (For modern mapping, it was unfortunate that they took a measurement fractionally too small, so that there are more than 10 000 kilometres for Equator to Pole, hence a need to allow an extra digit in so many data fields.)

The French use of hundredths fitted their decimal mania, which introduced 100 degrees to the right angle, 100 minutes to that degree, so the kilometre is just a centessimal geographic mile. Eratosthenes, 2000 years before the introduction of the metre, is on record as having measured Earth, alongside the Nile, with similar intent, in the context of the right angle being of 90 degrees of 60 minutes each. We know only imprecisely his findings, but mankind's largest monument may well record, with great precision, the findings of some unknown predecessor over 2000 years yet earlier. The Great Pyramid at Ghiza was measured in the 1880s, by Flinders Petrie. He found the sides to be from 230.25 to 230.44 m long, averaging 230.355 m. The Ancient Egyptians used a fathom, too. The unit is fundamentally the distance between the respective fingertips of horizontally outstretched hands and arms, and inherently equal to four cubits – the length of the forearm to outstretched fingertips. If the Pyramid were 500 cubits each side (and perhaps 1000 natural feet), their cubit would be 0.4607 m, a thousand of their fathoms would be 1842.84 m. This is within 0.5% of the International Nautical Mile of 1852 m – the modern enshrined value for the geographic mile. Presumably those very ancient peoples measured Earth and found the minute along the meridian to be so close to 1000 of their established fathoms that they decided to standardize the unit (and its derivatives) on this natural distance, creating as they did the rather odd concept of the geographical mile.

Before leaving this subject, which I unearthed in researching my encyclopedia, I should mention the Chinese. They measured Earth over the years 723 - 726, from Vietnam to Manchuria (twice the distance of the French), to establish the size of their li (about half a kilometre). Unfortunately they used the indirect method of the proportional length of a shadow, i.e. the tangent function rather than the angle itself, which caused repeated troubles. A few years later, in 792 and a 1000 years before the French, they decimalized their weights and measures, but left their angles, for many more centuries, with 36514 to the circle, i.e. the amount the sky shifts night-to-night. (The Babylonians had this approximated as 6 times their standard 60, making the aliquot triangles of the regular hexagon perfect.)

I'd like now to shift further back in my time, but to the most modern of measuring technology – the artificial satellite. My first career position was a scientist with the rocket research station in South Australia, known to many through its testing ground – the Woomera Rocket Range. With its base fairly close to the central point on the southern coast of Australia and its firing direction NW, the Range stretched over 2000 km of very sparsely inhabited land before crossing onto the ocean. Using one of earliest commercially available computers and various data-collecting instruments, we plotted the tracks of missiles and target planes to study the performance of engines and guidance systems. I was particularly concerned with using kinetheodilites (cinéfilm-equipped hand-steered theodolites). The rapid-exposure pictures showed the azimuth and elevation of the instrument, which had to be augmented by the *x-y* offset, from centre of the picture, of the marker point on the tracked object. Using synchronized observations from two or more instruments

continued next page

(and correcting for optical refraction, using meteorological observations) allowed us to locate the object, hence develop a mathematical picture of its path.

That was usually for targets flying at an altitude around 10 000 m, with observing stations similarly spaced on the ground. Preparations were being made for the much greater altitudes reached by ICBM's when, in 1957, the USSR put the first satellite into orbit. Sputnik I was over 150,000 m above us, and barely the size of a baseball, but it did shine in the twilight sky. The challenge to the steering staff on our instruments plus the relative closeness of the stations for such an altitude impaired the quality of the results, but the uniqueness of Woomera allowed us to make a significant contribution to tracking this new technological wonder. We knew its orbit, but needed more precision. Fortunately, preparations for the forthcoming space activities of the USA, in which Australia was a special partner, were bringing other instruments, including the Baker-Nunn camera. This was an astronomical telescope with attached camera. Motorized, it could follow the great-circle arc of the known orbit, at the known angular speed. With open shutter, the single film frame produced a spot picture of the satellite, among streaking lines for any visible background stars. By closing the shutter momentarily a few times at specific moments during the transit, marker breaks were registered in those streaks. Each break spot represented the position of that star at that moment. Using routine astronomical almanacs, with their highly accurate positional data, any such spot gave an azimuth and elevation for the film. The *x-y* offset from the selected break spot to the satellite spot could then be treated just like any frame from a kinetheodolite, the successive moments of shutter closing allowing a time sequence. With the observing stations vastly more spaced apart than those of the earlier instruments and the great precision of the almanacs, plus the self-cancelling of optical refraction when using the background for reference, the result was a highly accurate trajectory.

My contribution was the tracking software; I had written it for atmospheric rockets, adapted it first to the high-altitude then to the new instrument. Knowing what the USSR was doing was the motivation for all this effort. It was just more missile research for us. But it reached into other affairs.

When I retired in 1992 I volunteered to introduce and teach, in the Dept. of Geography, a course in Cartographic Science for senior students. Picking up a life long interest in cartography (marked in my library by Meiklejohn's Atlas, bought in my pre-teens for its exposition of map projections), the commitment required some reading before teaching began. There I had the surprise of reading how our knowledge of Earth's size and shape were enhanced by observing the paths of satellites, using first kinetheodolites then Baker-Nunn cameras. Unwittingly, I had made a contribution to cartography; I think you will realize that it was a very pleasing discovery.

I am currently trying to make a further contribution, by writing a cartography book. While map projections are covered in very many texts, there seems to be a huge void between the superficial coverage of a general geography book and the plunging depths of the mathematically literate book. Simple trigonometry is required for virtually all projections, and calculus for very many. But many require the greater complexity of differential geometry – a field of mathematics developed for cartography but challenging even to Honour Math students – while those now used for satellite-based observations involve heavyweight differential equations. What troubles me is that the deeper books plunge into the deeper mathematics very quickly. So I'm writing a text that does all it can at one level of math before introducing the next, while maintaining a logical sequence for the cartography. It includes many illustrative basic maps (usually just coastlines), plus explanatory tutorials for each new mathematical step. It is about half written, has nearly 100 projections covered in 250 pages – but has yet to involve differential geometry! The audience might be small, but I believe a clear exposition of mathematical cartography needs to be available.

Calendar/ *calendrier*

February 18-23 février 2002
GEOMATICA 2002
III International Congress,
Palacio de las Convenciones de La Habana, La Habana, Cuba
For information / *pour renseignements*:
Ing. Tatian Delgado Fernandez
Email: *geocuba@geocuba.mic.cu*
or *geocuba@geocuba.get.cma.net*
Facsimile: (537) 24 2869

March 19 - 23 mars 2002
AAG 98th Annual Meeting
Los Angeles, California
For information / *pour renseignements:*
www.aag.org

May 26 - 29 mai 2002
l'ACC/CCA MMII
Sir Wilfrid Laurier University
Waterloo, Ontario
For information / *pour renseignements:*
email Grant Head at
ccacc@wlu.ca

May 28 mai - June 1 juin 2002
CAG 2002
Toronto, Ontario
Joint Hosts: University of Toronto, Ryerson University and York University
For information / *pour renseignements:*
http://zeus.uwindsor.ca/cag

July 9 - 12 juillet 2002
Joint International Symposium: Geospatial Theory, Processing and Applications
Ottawa, Ontario
For information / *pour renseignements:*
www.geomatics2002.org

October 9 - 13 octobre 2002
NACIS XXII
Columbus, Ohio
For information / *pour renseignements:*
www.nacis.org/columbus

David Broscoe
Algonquin College

GIS is Everywhere, GIS is Invisible

The theme of the GIS 2001 Conference held in Vancouver this past February (*www.gis2001.com/program/opening.htm*) was ***Branching Out: Spatial Technology Goes Mainstream***. Geographic Information Systems are becoming more and more integrated with Information Systems, as evidenced by topics addressed in the plenary session. These topics included Open Standards, Internet GIS, and Spatially Enabled Databases. According to Sam Bacharach of the Open GIS Consortium, Open Standards for GIS mean that geoprocessing algorithms are becoming standardized and available outside of 'isolated GIS stovepipes'. Bacharach thinks that 'all information systems will someday be able to easily use georeferenced data and geoprocessing components'. The ubiquity of geographic data on the Internet is without question. Discussing Spatially Enabled Databases, Xavier Lopez of Oracle Corp. notes that recently database vendors 'are allowing GIS to emerge from the back room by integrating geospatial data management technology with traditional RDBMS [Relational Database Management Systems]'.

For further evidence of GIS in the mainstream, let's examine the newest releases of ESRI software, not as a vendor's plug but as an example of trends within GIS. With the version 8 release of ArcView and ArcInfo, ESRI has provided a consistent interface to all of its GIS software. The look and feel of the software remains consistent, a standard Windows type GUI, regardless of the application. To run ArcInfo, you no longer need to type at the command line prompt or build your own menu system.

In addition, the approach to software customization is consistent, through a COM Object Model (according to ESRI, the largest and most complex object model in the world). This object model is implemented through Visual Basic for Applications (VBA) within the GIS environment or through a visual programming language such as Visual Basic or Visual C++ to create stand-alone applications. In other words, one does not need to master a GIS-specific programming language such AML or Avenue in order to tweak the GIS software or create a stand-alone application using Geographic data. As the source code is hidden in the COM component, the software developer who uses the functionality available in the COM model need not understand the algorithm behind the software. The COM object is a black box with no access to the source code.

What does this integration of GIS into IS mean for the GIS and Cartographic community? I think there are a number of implications:

- Research into geoprocessing may to fall increasingly outside of the geographic and cartographic community.
- High-end GIS software will be easier for the casual user to use.
- GIS customization and the development of stand-alone applications will be seen to be available to anyone with a general computing background.
- Cartography as a stand-alone discipline may become more marginalised.

All of the factors above mean that we as GIS professionals and Cartographers need to seriously rethink our roles in a world where spatial data is widely available and used but where the users of the data may not have the specialized knowledge to use it wisely.

Certification News

I have pursued the Geomatics Certification issue as Cartographic Education Chair and more recently as a member of the President's Special Committee on Certification with Patricia Chalk and Peter Keller. I will continue to use the Special Interest Group column as a vehicle for communication on this issue.

I was able to attend the ESRI Users Group Conference in San Diego this past summer, a many ring circus with more than 10,000 participants. While there I attended all the sessions I could which related to GIS Certification with the hope that I could learn something relevant to the CIG Geomatics Certification Initiative. The consensus at the conference is that the ASPRS GIS Certification is not working, mostly because it is not seen as essential in order to work in the field. As a voluntary GIS certification, it has not become a de facto standard. With disciplines such as surveying and photogrammetry the ASPRS initiative is more successful. American GIS practitioners are casting about for another organization or coalition of organizations to organize certification, for example GITA and/or URISA, but I'm not convinced that another organization would do any better.

NASA was cited as an organization studying the issue. I was able to find a reference to the GeoSpatial Workforce Development Center, which has published an extensive document on 'Geospatial Technology Competencies, Roles, Outputs, Quality Requirements and Role Profiles' (*http://geowdc.st.usm.edu/research/research.htm*) which readers may find interesting. The most complete set of certification links which I have discovered is maintained by Karen Kemp and is found at *http://cem.uor.edu/users/kemp/certification/*.

Joe Piwowar
Spatial Information Systems

Have You Seen the Light?

In my last column ("What's the Sense?", *Cartouche* No. 42, pg. 7), I examined the methods that we could use to measure things from a distance and I concluded that most remote sensing systems are designed to measure the amount of light received from objects on the Earth's surface. But just measuring the *amount* of light isn't enough: Ideally, we want to be able to identify the objects we see automatically and unambiguously. How can we do that?

Consider this scenario for a moment. You have just learned that your distant Uncle Ben is coming for a visit and you are to meet him at the airport. Since you have never met him before Ben said that he would mail you a photograph of himself so that you would recognize him in the airport crowds. A couple of days before Ben's arrival you receive the photo in the mail. The picture shows 5 men standing in a row with the instructions that all the men are wearing navy blue shirts, except Ben – his is chocolate brown. You think that this is simple enough until you look at the photo and realize it was taken in black and white. All the men appear to be wearing the same tone of dark-grey shirts!

The point of this story is that just showing the amount of light reflected from an object doesn't give us enough information to discriminate between it and other objects in the scene. We need to capture other qualities about the light we receive. It just so happens that if we look at *light* in a bit more detail we can see *colour*. Let me explain.

What is Light?

"Light" is the name we give to one small form of *electromagnetic radiation*. Other types of electromagnetic energy include X-rays, ultraviolet rays, infrared rays, and radio waves (Figure 1). All forms of electromagnetic energy are believed to travel in waves and can be identified by measuring how long the waves are - i.e., by their wavelengths. Scientists studying electromagnetic radiation have noted that certain wavelength ranges interact with physical objects in unique ways. For example, x-rays are capable of passing through soft skin tissue and are reflected back to the camera by harder bone matter. Light, on the other hand, cannot pass through skin to any significant amount and any photos we take of people show their outsides rather than their insides. By convention, ranges of electromagnetic wavelengths having similar distinguishing properties have been given identifying labels. Thus it is that we have come to know the wavelength range to which our human visual system is sensitive (from about 0.4 µm to 0.7 µm) as "light".

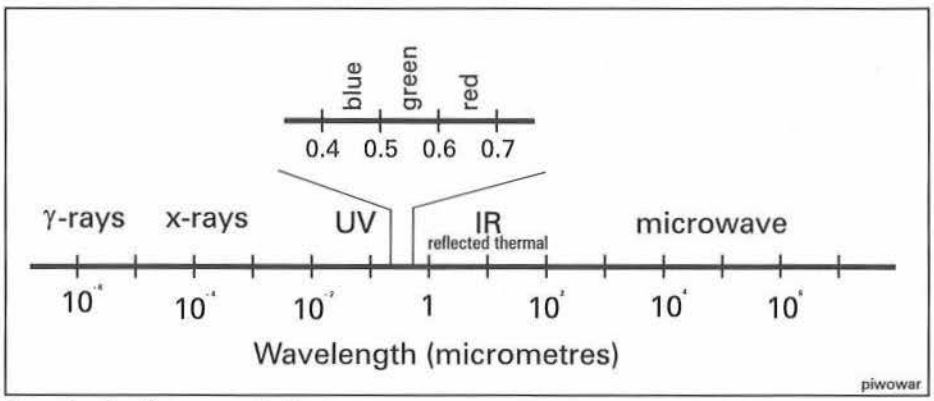

Figure 1: The Electromagnetic Spectrum

What is Colour?

Actually, our eyes can differentiate between the amount of radiation entering them in much smaller wavelength ranges than 0.4-0.7 µm. We can, for example, tell the difference between energy with wavelengths between 0.4 and 0.5 µm from energy between 0.5 and 0.6 µm. When we are looking at something interesting our brain doesn't say, "Oh, I am detecting radiation entering the visual system at 0.65 µm!" Rather, it translates this into, "Oh, I see something red!" since "red" is the label we have conventionally given to the range of electromagnetic wavelengths between 0.6 and 0.7 µm.

Why do we see colour?

The Sun (or other white light sources) pumps out equal amounts of radiation across the wavelengths in the visible range, that is why sunlight appears white to us. But wait! If we go outside on a bright sunny day and note that the sun is shining white light down on everything around us, why is it that trees and grasses appear green, asphalt, black and water, blue? It is because the chemical and physical make-up of these objects interact with incoming solar radiation in different ways. Healthy vegetation, for example, appears green to us because chemical and physical composition of the leaves absorb most of the sun's energy arriving at blue and red wavelengths and reflects much of it in the green spectral region. Similarly, water absorbs green and red radiation and reflects some of the blue energy. Black asphalt absorbs a lot of the radiation equally across the visible spectrum (which is why black objects heat faster in the sunlight). "Colour", then, is the amount of visible radiation reflected from an object in disproportionately high amounts at certain wavelengths.

Remote sensing systems exploit this definition of colour by splitting the visible

continued next page

spectrum up into spectral regions, or bands, and simultaneously measure how much energy is received in each band. The first 3 channels of the ETM+ (Enhanced Thematic Mapper) on Landsat 7, for example, are sensitive to blue, green and red spectral wavelengths, respectively. Suppose we noted that a pixel had a value of 10 in ETM+ band 1, a value of 25 in ETM+2 and a value of 200 in ETM+3. We would conclude that since its red (ETM+3) value was so much higher than the values in the other bands, that this pixel would be representing an object whose colour is red.

This is exactly how multispectral classification algorithms work, except that they are much better at discriminating between tiny changes in pixel values than our eyes can.

Interestingly, colour film works this way too. Colour films have 3 separate layers, each one sensitive to one of red, green, or blue radiation. So if Ben had sent you a colour photo, you would have no problem picking him out of the group.

In the beginning of this article I asked how remote sensing systems can identify the objects they see automatically and unambiguously. It turns out that the way most systems operate is by detecting the amount of sunlight reflected from objects in different wavelength bands of the electromagnetic spectrum.

Now that you know what *I* think, let me know what *you* think! E-mail me at piwowar@uwaterloo.ca.

Postscript

Another remote sensing satellite launch went awry on September 21. A Taurus rocket launched from Vandenberg Air Force Base in California "experienced an in-flight anomaly of an undetermined nature" which failed to give it enough velocity to stay in orbit. The rocket was carrying the Orbview-4 satellite that was designed to take black-and-white pictures with 1-meter resolution and to return full colour imagery with 4-metre resolution. As such the Orbview-4 would have been a direct competitor to the present IKONOS system. This loss was the fourth failed launch of a new remote sensing satellite in as many years.

Patricia Chalk
University of Western Ontario

Mot du Président

President's Message

Report from the President's Special Committee - Executive Structure

At our meeting in Montreal, a President's Special Committee was struck to examine options for the VP, P and PP length of office, their appointments to positions and tasks. Since then, the committee has worked diligently to reach a consensus on several matters and their recommendations have now been provided to the executive for consideration. Given that the executive accept the recommendations, constitutional changes may be required, with motions to amend the constitution being circulated to the general membership at least 45 days prior to the Annual Meeting. For your information, our constitution may be amended by a vote of two-thirds of the voting members at the Business Meeting conducted during the Annual Meeting, providing there is a quorum. Thanks to Cliff Wood (Chair), Roger Wheate, Henry Castner, Gary McManus and Monika Rieger for their prompt attention to this important matter. I will report in greater detail once the executive has met to review the recommendations and decided on a path of action.

New Membership Coordinator 'In Training'

It is with great pleasure that I report the appointment of Clint Loveman as our Membership Coordinator "In Training" and welcome him to the CCA executive. Clint, an ESRI employee, is a developer/ programmer for a topographic map production system, he does map production and design, as well as graphic design for his department.

Clint is currently in the midst of becoming familiar with the CCA membership database and learning the ropes from the grand master of membership affairs - Monika Rieger. A notice will be circulated on the CCA listserv cca-list@geog.ubc.ca to announce when Monika has begun celebrating her retirement from the position and when Clint is officially on deck. Clint may be reached at: cloveman@esri.com.

CCA Administrative Secretary Opportunity

The CCA Executive is searching for a member who is interested in filling a new position in the association. The administrative secretary will assume some of the 'front office' activities previously undertaken by the membership coordinator, and also the role of taking minutes at executive and annual meetings (previously the responsibility of the treasurer). This individual will be responsible for receiving all general mail for the association, as well as receiving and sending out membership renewal forms generated by the membership coordinator. The individual needs to be in a position where their postal address may act as the association's mailing address as well, for their term of office. A Canadian address is required. If you have considered becoming part of the CCA executive, this is a great opportunity to seize the day! Please contact president, Patricia Chalk to discuss this position in greater detail. Phone: (519) 661-3425; email: chalk@uwo.ca

CCA AWARDS OF DISTINCTION 2001
PRIX DE DISTINCTION 2001 DE l'ACC

Award for Exceptional Contributions to the CCA

ED DAHL

Edward Dahl graduated from the University of British Columbia with a B.A. in History and English in 1967 and an honours equivalent in Canadian History in 1968, and from Carleton University with an M.A. in Canadian History in 1969. Ed joined the public service in 1970 as Head of the Reference Unit in the National Map Collection. In 1974, he became Head of the Canadian Section and two years later was made the Chief of the Early Canadian Cartography Section. In 1987, Ed was named the Early Cartography Specialist in the Cartographic and Architectural Archives, a position he held until his retirement in 1998.

Ed has had a long involvement with the Canadian Cartographic Association. He served as the Secretary of the History of Cartography Interest Group from 1976-1978, and as Chair from 1979-1981. Ed served as an Associate Editor of *Cartographica* from 1981-1994, and has been on the editorial board since 1994. Other journals, such as *The Map Collector*, *Meridian* and *Archivaria*, have also benefited from Ed's careful attention to details. He has been involved in most of the major historical cartography organizations, ranging from the International Cartographic Association (as the Canadian representative on the History of Cartography Commission since 1990), the International Map Collectors' Society (as the Canadian Representative since 1982), the Society for the History of Discoveries (as a Member of Council in 1988-90 and 1995-97), the Cartographic Information Specialists Association (as a member of the Planning and Co-ordinating Committee since 1988), to the Pan-American Institute of Geography and History (as the Canadian Representative on the History of Cartography Group from 1982 to 1998). As well, he was involved in co-founding the Ottawa Map Society in 1980 and serving as Co-Chair from 1980 to 1987.

Brian Klinkenberg (right) presents Award of Distinction to Ed Dahl. Brian Klinkenberg (à droite) remet un Prix de Distinction à Ed Dahl.

Ed has many publications to his credit, such as *Winnipeg in Maps, 1816-1972* with Alan Artibise, and *Treasures of the National Map Collection ... Exhibition of 100 Original Maps, Atlases, Globes and Architectural Plans 1490-1982*, as well as numerous articles and conference presentations related to historical cartography and map librarianship. Since his retirement he has kept busy, co-authoring (with Jean-François Gauvin) the lavishly illustrated book *Sphæræ Mundi: Early Globes at the Stewart Museum* which was published in 2000 in conjunction with the Stewart Museum's 'beautiful' exhibition, also co-organized by Ed, entitled "Yes! The World is Round: A Closer Look at Early Globes, Maps and Scientific Instruments" held in Montreal from February, 2000 to March, 2001, and seen by over 60,000 visitors!

This *Award of Distinction for Exceptional Contributions to the CCA* is being awarded to someone who has already accomplished more than most people do in a lifetime–yet Ed still has a lifetime of achievements ahead of him! The tapestry that is the history of cartography is richer in no small part because of the many and varied contributions of Edward H. Dahl. No one is more deserving of this recognition than Ed.

Prix pour une contribution exeptionnelle à l'ACC:

ED DAHL

Edward H. Dahl obtint un baccalauréat en histoire et en anglais de l'Université British Columbia en 1967, ainsi qu'une spécialisation en histoire canadienne, en 1968. En 1969, il termina une maîtrise *es Art* à l'Université Carleton en histoire canadienne. Ed joignit les rangs de la fonction publique en 1970, comme chef de l'unité de référence de la Collection nationale de cartes et plans. En 1974, il devint le chef de la section canadienne et deux ans plus tard, chef de la section de la cartographie ancienne. En 1987, Ed fut nommé spécialiste de la cartographie ancienne de la Division des archives cartographiques et architecturales; un poste qu'il occupa jusqu'à sa retraite en 1998.

Ed s'est grandement impliqué au sein de l'Association canadienne de cartographie. Tout d'abord, de 1976 à 1978, il occupa le poste de secrétaire du groupe d'intérêt sur l'histoire de la cartographie, puis celui de président de ce groupe, de 1979 à 1981. Ed a aussi œuvré comme éditeur associé de la revue *Cartographica* de 1981 à 1994, et depuis 1994, y occupe un siège au comité éditorial. D'autres publications, comme *The Map Collector*, *Meridian* et *Archivaria*, ont aussi bénéficié de ses grandes connaissances. Ed s'est également impliqué dans presque toutes les associations de cartographie historique; que l'on pense à l'Association cartographique internationale (comme représentant canadien à la Commission sur l'Histoire de la cartographie depuis 1990), à l'*International Map Collectors' Society* (comme représentant canadien depuis 1982), à la *Society for the History of Discoveries* (comme membre du conseil de 1988 à 1990 et de 1995 à 1997), à la *Cartographic Information Specialists Association* (comme membre du comité de planification et de coordination depuis 1988) et à la *Pan-American Institute of Geography and History* (comme représentant canadien pour le groupe sur l'histoire de la cartographie de 1982 à 1998). De plus, il fut le co-fondateur de la *Ottawa Map Society* en 1980 et en occupa les fonctions de co-président de 1980 à 1987.

Ed a également plusieurs publications à son actif : Winnipeg par les cartes, 1816-1972 publié en collaboration avec Alan Artibise; Les trésors de la Collection nationale de cartes et plans, Archives publiques du Canada: Une exposition de 100 cartes, atlas, globes et plans architecturaux originaux, 1490-1982, ainsi que plusieurs articles et présentations à des conférences reliées à la cartographie historique et au domaine des cartothèques. Depuis la retraite, il a aussi publié, en collaboration avec Jean-François Gauvin, le livre magnifiquement illustré Sphaerae mundi: la collection de globes anciens du Musée Stewart qui accompagne l'exposition du Musée Stewart intitulée *"Oui! La Terre est ronde. Globes, cartes et instruments scientifiques anciens"*. qui eut lieu à Montréal, durant les mois de février et mars 2000 et dont Ed fut le co-organisateur. Plus de 60 000 personnes visitèrent l'exposition!

Ce prix de distinction est décerné à quelqu'un qui a déjà accompli plus que la plupart des gens au cours d'une vie - et Ed à encore un vie d'accomplissement devant de lui ! Le domaine de l'histoire de la cartographie s'est grandement enrichi des nombreuses contributions d' Edward H. Dahl. Personne ne mérite davantage cette reconnaissance que Ed.

Prix pour une contribution exceptionelle d'erudition sur la cartographie:

JEAN-LOUIS RAVENEAU

Ce soir, nous honorons, pour sa contribution exceptionnelle en cartographie, dans le monde scolaire, Monsieur Jean-Louis Raveneau, professeur de l'Université Laval, de 1963 à 1999.

Il obtient sa licence en géographie (1962) et son Doctorat de géographie/ cartographie (1966), à l'Université de Strasbourg (France). Sa carrière sera exceptionnelle à plus d'un titre. En effet, il a si l'on peut l'exprimer ainsi, une fiche de route fort impressionnante : il a initié à la cartographie, pendant plus de 36 ans, plusieurs milliers étudiants, à raison de 4 cours par année ; il a supervisé plus de cinquante mémoires de recherche de 1er cycle ainsi que 20 mémoires de maîtrise et a été membre du comité de direction de 9 thèses de doctorat.

De l'enseignement traditionnel avec le tire-ligne, en passant par le traceur Leroy, le letraset et le tracé sur couche (Scribe coat), il s'intéressa rapidement à l'informatisation de la cartographie qui, à ce moment, ne se faisait qu'avec des cartes perforées. Il sera l'un des principaux instigateurs de la cartographie numérique au Québec ; il débute avec le logiciel "Trans-impro secteur ", développé à L'Université Laval, qui deviendra plus tard "Théma".

Dès 1987, il portera ses réflexions sur le concept d'Atlas électronique, qu'il expérimentera avec Hypercard. Il a toujours fait preuve d'une grande ténacité face à l'informatisation du domaine et pour ce, il fera le nécessaire pour se maintenir à jour, à la fine pointe des derniers développements dans le domaine. Autant il était défenseur de nouvelles approches de la cartographie, autant il en était le critique lorsque cela s'imposait.

Michel Fournier (à gauche) remet un Prix de Distinction à *Jean-Louis Raveneau. Michel Fournier (left) presents the Award of Distinction to Jean-Louis Raveneau.*

Dans son enseignement, il était dévoué à ses étudiants. Avec une grande patience, il était prêt à mettre les énergies nécessaires pour que ses étudiants réussissent. Pour lui la cartographie est un outil et par conséquent, il lui importait que les étudiants en saisissent bien les subtilités pour qu'ils puissent bien l'utiliser dans le futur. D'ailleurs aujourd'hui, plusieurs d'entre-eux ont pris la relève dans nos universités, transmettant connaissance, enthousiasme et passion de la cartographie.

Il sera l'auteur de plus de 75 publications sur des sujets aussi divers que l'enseignement de la cartographie, le langage graphique, la cartographie thématique et numérique. Parmi ses publications, figurent le dossier cartographique de Charlevoix, l'Inter-Atlas, l'Atlas environnemental du Saint-Laurent ainsi que sa collaboration au Comité de rédaction de L'Atlas du Québec et de ses régions, diffusé sur Internet. Il a été rédacteur (1970-76 et 1998-99) et administrateur (1976-87) au Cahier de géographie du Québec, une revue scientifique de grande qualité.

Malgré ce palmarès fort impressionnant, Jean Raveneau a accompli sa carrière avec un certain effacement car il est de la trempe de ces hommes discrets et efficaces qui marquent leur époque. Lorsqu'il s'engage dans un projet ou avec des étudiants, il déploie un maximum d'énergie pour aller jusqu'au bout. Ceux qui l'on côtoyé en tant que professeur ou autrement lui sont redevables car il a su transmettre à un grand nombre, le goût de faire de la cartographie, une cartographie de qualité.

L'Association canadienne de cartographie est fière d'attribuer, aujourd'hui, le premier Prix de distinction de son histoire à un collègue de la communauté francophone, pour une contribution exceptionnelle en milieu scolaire, pour la flamme qu'il a transmise à plus d'un ainsi que pour sa contribution à l'évolution et au développement de la cartographie.

Award for Exceptional Scholarly Contributions:

JEAN-LOUIS RAVENEAU

This evening, for exceptional scholarly contributions to cartography we honour Jean-Louis Raveneau, professor at Laval University from 1963 to 1999.

Jean obtained his License in Geography (1962) and his Doctorate of Geography/Cartography (1966), from the University of Strasbourg (France). His career was to be exceptional in many respects. Indeed, he has a very impressive record. During more than 36 years of teaching he has introduced to cartography several thousand students, at the impressive rate of four courses a year. Professor Raveneau has supervised more than fifty cycle research reports, as well as twenty master's theses and has served on the advisory committees of nine doctoral theses.

Jean started out teaching the traditional cartographic methods - the Leroy drawing pen, Letraset scribecoat and scribing. However early on he became interested in computer assisted cartography, which in the early days meant using punch cards. He was one of the first advocates of digital cartography in Quebec. At the University of Laval he helped develop the "Trans-impro secteur" software which was later to become known as "Théma."

In 1987 he turned his attention to the concept of the electronic atlas and began to experiment with HyperCard. Jean approached the new field of computer cartography with great tenacity. He would do what ever was necessary to keep up to date with the fast changing developments in this new field. He was as fierce defender of the new developing fields in cartography as he would be a critic if it became necessary.

As an educator he was devoted to his students. He approached teaching with a great amount of patience, and was always ready to put the necessary energy into it to ensure that his students were successful. For Professor Raveneau cartography was a tool and consequently it was important to him that the students completely understand the subtelies of cartography in order that they could use it in the future. Today, many of his students can be found in our universities passing on his knowledge, enthusiasm and a passion for cartography.

He is the author of more than 75 publications on subjects ranging form cartographic education, graphic language, thematic mapping and digital cartography. A few of his publications include: *cartographique de Charlevoix, l'Inter-Atlas, l'Atlas environnemental du Saint-Laurent*. As well as his collaboration with the editorial committee for *L'Atlas du Québec et de ses régions*, on the Internet. He has also served as a writer (1970-76 and 1998-99) and as an administrator (1976-87) for the *Cahier de géographie du Québec*, a high-quality scientific review.

In spite of this very impressive list of accomplishments, Jean Raveneau carried out his career in a very discreet and quite manner. When he undertakes a project or teaches he exudes the maximum amount of energy up to the very end. Those who have worked alongside him as professor or otherwise are appreciative of him because he always knew how to give a big complement when a job was well done.

The Canadian Cartographic Association is proud to present this award today, the first prize of distinction in its history to a colleague of the French-speaking community, for an exceptional scholarly contribution to Cartography. This award is in recognition of not only the torch which he has passed on to more than one of us but also to recognise his contribution to the evolution and to the development of cartography.

Award of Distinction for Exceptional Professional Contributions to the Practice of Cartography:

LOU SEBERT

Louis Mason Sebert was born in London, Ontario in 1916. He grew up in Toronto where he was educated at the University of Toronto schools and the University of Toronto, graduating in 1940 in Mining Engineering.

He then joined the Canadian Army and served with the Royal Canadian Dragoons in Italy and Northwest Europe. In 1947 he transferred to the Royal Canadian Engineers (the Army Survey Establishment). This was a technical unit involved in producing maps of the National Topographic System, at that time working mostly in the northwest part of Canada.

In addition to topographic mapping, he was involved in several international mapping projects. When Canada joined the Pan American Institute of Geography and History (PAISH) he was appointed as Canadian Member on the Thematic Maps Committee and held this position for 12 years; in 1962 he and Douglas Baldock were the Canadian members at the UN conference on the International Map of the World (1:1,000,000) in Bonn.

Roger Wheate (left) presents the Award of Distinction to Lou Sebert. Roger Wheate (à gauche) remet un Prix de Distinction à Lou Sebert.

In 1965 he retired from the Army and joined the Topographical Survey. In 1975 with Bernard Gutsell, he helped found the CCA, serving as its first secretary until 1979 (Lou and Bernard are our two lifetime honorary members). He retired in 1981 but continues to write on surveying and mapping subjects. These include 'Every Square Inch: the Story of Canadian Topographic Mapping', 'The maps of Canada' (with Norman Nicholson) and 'Mapping a Northern Land' (with Gerald McGrath).

Prix pour une contribution exceptionelle dans la pratique de la cartographie:

LOU SEBERT

Louis Mason Sebert est né à London, Ontario en 1916. Il a grandi à Toronto où il a été instruit aux ecoles de l'université de Toronto, et l'université de Toronto, recevant un diplOme en 1940, en génie des mines d'exploitation.

Il a alors joint l'armée canadienne et a servi avec les Dragons Royaux canadien en Italie et en europe du nord-ouest. En 1947, il a été transfèré chez les ingénieurs royaux canadiens (l'Etablissement d'enquEte de l'armée). C'était une unité technique impliquée dans la production des cartes du système topographique nationale, à ce moment-là surtout pour la règion nord-ouest du Canada.

De plus, il a participé à plusieurs projets cartographiques internationaux. Quand Canada a adhèré à l'institut pan-americain d'histoire et de geographie, il a été nommé membre canadien au comité thématique de cartes et a occupé cette position pendant 12 ans; en 1962, Douglas Baldock et lui furent les membres canadiens à la conferénce de l'ONU sur la carte internationale du monde (1:1000000) à Bonn.

En 1965, il a pris sa retraite de l'armée et a joint l'étude topographique ['Topographical Survey']. En 1975 avec Bernard Gutsell, il a aidé à fonder l'ACC, occupant le poste de premier secrétaire jusqu'en 1979 (lou et Bernard sont nos deux membres honoraires à vie. Il s'est retiré en 1981, mais continue à écrire sur les sujets de examiner ['surveying'] et la cartographie. Ceux-ci incluent 'Every Square Inch', 'The maps of Canada' (avec Norman Nicholson) et 'Mapping a Northern land' (avec Gerald McGrath).

Two aphorisms in GIS and Cartography

by Lou Sebert

[This was Lou's response on receiving the award for exceptional contributions to the practice of Cartography.]

There is one advantage in growing old and that is the ability to look back over the progress of one's profession for a longer number of years than younger people. In my case I have seen many innovations and changes in cartography. Some have been trivial, such as the abandonment of pen and ink drafting for scribing, but some have been fundamental, such as the invention of the Geographic Information Systems (GIS).

The mention of GIS reminds me of two aphorisms that I would like to leave with you. Some of you may think them trite, others may consider them profound. I will leave that up to you.

The first aphorism is: GIS is to geography what the telescope was to astronomy. A little too sweeping? Perhaps, but consider that today no graduate course in geography is given without some application of GIS. And consider the vital role of digital cartography in the success of GIS. It is all well and good to invent a system for the mass gathering of data but unless you have a second system for making the data intelligible, the first system is useless.

As a simple example of this consider a digital terrain model. Here the output is a sheet of paper covered with figures (elevations) that to a quick glance looks like a screen door. But pass the data through

New Geoid Model Provides Accurate Elevations

OTTAWA — A new Geoid model and software with the capacity to provide accurate elevations across Canada were released today by Natural Resources Canada at the GeoSask2001 conference in Regina.

The Canadian Gravimetric Geoid model (*CGG2000*) and Canadian Height Transformation Package (*GPS•H Package*), the latest advance in the Canadian Spatial Reference System (CSRS) allows direct conversion of NAD83 (CSRS) GPS ellipsoidal heights, to the more useful orthometric elevations (heights above mean sea level), referenced to Canada's standard vertical datum, CGVD28. Users will now have the capability, depending on the procedures used, to obtain decimetre-level elevations or better throughout the country.

This capability will result in economic and environmental benefits. Vertical data is used for such applications as water and watershed management, flood-plain mapping and marine safety. It is also used in GPS-based precision farming, for example to control unwanted runoff and stream contamination, and for forestry applications, such as modelling the spread of wild fires. In order to integrate and share this data, it must be based on standardized measurements and referenced to a national infrastructure.

The model and software package are the result of a five-year collaboration with international, federal and provincial agencies, and academic institutions. The CGG2000 model replaces the previously adopted GSD95 model.

Through advances in the CSRS and products such as these, NRCan provides a framework for the greatest possible accuracy for all spatial positioning and makes this framework as accessible as possible to GPS users in Canada. The CSRS system is a fundamental building block for GeoConnections, a federal–provincial partnership for sharing and integrating geospatial data on the Internet.

GeoSASK2001 — Spatial Technology, the Route to Better Decisions, is a three-day conference for users of spatial information systems hosted by the Geomatics Industry of Saskatchewan and the Information Services Corporation of Saskatchewan at the Delta Hotel Trade and Convention Centre from October 16 to 18.

The GPS•H Package includes the Canadian Gravimetric Geoid model (CGG2000), HTv2.0, and the new version of the software GPS•Hv2.1. Subscribers to the CSRS database can download the package free from *http://www.geod.nrcan.gc.ca/* (under Products and Services). It is also available on CD-ROM for $40 in either English or French from the following address: Geodetic Survey Division, Room 440, 615 Booth Street, Ottawa, Ontario K1A 0E9 (tel. (613) 995-4410, (613) 995-32150

Good looking Free DEM data

The Yukon Government Department of Renewable Resources web page is offering free of charge, 90 metre DEM data. This has been interpolated from the CNTB 1:50,000 map sheets, but intended for use at 1:250,00 (in other words, it is likely better than the 1:250,000 data !)

http://renres.gov.yk.ca/pubs/rrgis/data/data_desc/90m_dem.html#50kntdb

Please email me if you know of other sites for free (topographic) data in Canada.

Roger Wheate: wheate@unbc.ca

the appropriate software that sorts the elevations into contours and you have a terrain model that displays the hills and valleys, and shows where the rivers flow and where roads can be built.

My second aphorism was first voiced by Professor Ormeling of the International Training Centre in Holland. He was the principal of this school which was founded to train surveyors, cartographers and geographers of many countries but mostly of the third world. He came to Canada periodically in the 1960s and 70s, mainly to visit ex-students who had immigrated here but also to encourage the Canadian government to hire more of them. At a small luncheon he gave for his ex-students at which I was invited, he gave a short speech during which he said, "I hope you realize how fortunate you are to be working in Canada. Canada is the world's largest cartographic laboratory".

That is my second aphorism, *Canada is the world's largest cartographic laboratory.* This was in 1970. Uki Helava, at the National Research Council had just invented the world's first Analytical Photogrammetric Plotter. Roger Tomlinson at the Department of Agriculture had just put into operation the first Geographic Information System. Dr Ray Boyle at the Canadian Hydrographic Service had developed a functioning digital hydrographic chart system. New and very useful cartographic software was appearing almost monthly. David Douglas, at Ottawa University, produced one of the contouring systems mentioned previously.

All in all, this was a very exciting time, and the excitement continues to this day. Thank you for this opportunity to speak to you.

[Footnote: At age 85, Lou continues to write on practical areas of cartography: see his most recent article on the Mercator Projection, in Geomatica 2001 (v55,#2).]

Canadian Cartographic Association
l'Association canadienne de cartographie

Conference and Annual General Meeting

Wilfrid Laurier University
Waterloo, Ontario

May 26 to May 29, 2002

The Conference is planned to begin Sunday with a field trip into Mennonite country and perhaps a workshop. Paper sessions, workshops and meetings will run on the Monday, Tuesday and Wednesday, this last day overlapping with the beginning of the meetings of the Canadian Association of Geographers and the Association of Canadian Map Libraries and Archives at nearby Toronto.

We solicit papers that range across the full breadth of cartography and geomatics. We also throw to you a challenge to respond to the theme ***"mapping and the masses"***!

Titles and abstracts can be sent to any of the Interest Group chairs, with a copy to the central programme co-ordinator Grant Head. Titles and abstracts are due March 1 2002, so that we can finalize a programme and provide it to you via the CCA website and a mailing during March.

A block of rooms has been reserved in our apartment-style residence on campus, and suggestions will be provided for other types of accommodation off-campus.

A warm welcome awaits in Waterloo!

C. Grant Head, CCA Conference
Department of Geography and Environmental Studies
Wilfrid Laurier University
Waterloo Ontario Canada N2L 3C5

email: ccacc@wlu.ca

Conférence et Assemblée générale annuelle

Université Wilfrid Laurier
Waterloo (Ontario)

du 26 au 29 mai 2002

La conférence débutera le dimanche, avec une occasion de se détendre en découvrant le paysage mennonite de la région et, peut-être même avec un atelier. Les présentations, les ateliers et les réunions auront lieu les lundi, mardi et mercredi. Cette dernière journée coïncidera avec le début des réunions de l'Association canadienne des géographes et de l'Association des cartothèques et archives cartographiques du Canada, qui se tiendront dans la région de Toronto.

Nous sollicitons des communications dont les sujets couvrent les champs d'activités de la cartographie et la géomatique. Nous lançons également le défi de répondre au thème de la « **vulgarisation et la cartographie** ».

Les titres et les résumés peuvent être envoyés aux divers président(e)s de groupes d'intérêt, et une copie doit être acheminée à Grant Head, président du programme de la conférence et ce, avant le 1ier mars 2002. Cela permettra ainsi de finaliser le programme afin de pouvoir le publier sur le site web de l'ACC et de vous le faire parvenir par courrier au cours du mois de mars.

Des chambres dans des résidences de style «appartement » ont déjà été réservées sur le campus. De plus, d'autres types de logement hors-campus pourrons vous être suggérés.

Un acceuil chaleureux vous attend à Waterloo!

C. Grant Head, Conférence de l'ACC
Department of Geography and Environmental Studies
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cour. élect: ccacc@wlu.ca

Harry Steward
Clark University

Naming the Discipline: Another Look at the Origin of Cartography

In teaching my introductory Mapping Sciences class, there is little time, with so much "practical" stuff to cover, to do more than take a quick glance at the intellectual roots of the discipline. This is partly a straightforward historical summation (if there is such a thing as straightforward history) plus a brief outline of discipline formation. In doing so, I note that we have signposts to innovation, in the appearance of new vocabularies to describe new concepts and processes; especially the invention or re-naming of the disciplinary titles. I do not, however, go much beyond dispensing simple attributions.

For example, I usually note that the appearance of "Remote Sensing" is due to Evelyn Pruitt, at the Office of Naval Research in Washington, in 1960. However, any inquisitive student consulting, *The Manual of Remote Sensing*, will find the professor's precision somewhat blurred: yes to the ONR; the sixties decade rather than just 1960; and no specific coiner-of-names but, instead, an unidentified group of researchers.[1] Does this matter ? Well, the initial, and seemingly rather unhelpful, answer is, "Yes and No".

Obviously there is a point to chronology, both in itself, and in its relationships to human and intellectual settings. There is, however, a point of vanishing returns in the race to establish exact conceptual dates: 1960 ? but what month ? day ? morning or afternoon ? before or after breakfast ? perhaps it was really 1959 ? and what about 'distant sensing' – could that be a lineal predecessor ? And, so on. It might be helpful, at this point, to remind oneself of the theory of errors, and recall that, in many map specifications, of the oft-quoted difference between accuracy and precision. "Sufficient accuracy for the purpose" seems to be the way to go. Or, in other words: yes, establishing a date and precedence for a new term is interesting in itself, and it can also acts as a contextual touchstone, but broader concerns; i.e., identifying trends, coherence, and movements or, (if we want to wade into deeper waters), establishing new paradigms; seems much more important.

A good example lies with the discipline that preceded remote sensing: photogrammetry. Here, *The Manual of Photogrammetry*, identifies one, A. Meydenbauer, as the first user of the word in 1893. I know next to nothing about this gentleman, but he is clearly outweighed in the significance stakes by Colonel Aimé Laussedat. Despite my aversion to naming individuals as the "Father" of their subjects, Laussedat, might count as an exception. He was way ahead of the field, in starting to investigate the application of photography to mapping, in 1849. Nine years later, when Nadar made the first aerial photograph from a balloon, Laussedat was simultaneously experimenting with using kites to do the same thing. He went on to produce the first photo-theodolite, make a photo-based plan of Paris and, after 50 years toiling, often under much derision, he produced a monumental three-volume summation of his work, finishing the same year that the Wright brothers made their first flight. It's an astonishing fact that when they took off the ground, the basis for aerial-survey was already established. Laussedat may not have invented the word, "photogrammetry", but he definitely invented the subject. [2]

Now, usually, I find this kind of narrative much more interesting than considerations of narrow etymological precedence. But, then, neither remote sensing nor photogrammetry is my specialist subject, nor, for that matter, are G.I.S. or hydrographic surveying, or several others on the list of the mapping sciences. So, in their cases, setting the general scene of their historical appearance is good enough. However, when it comes to cartography, things are different. I've indicated before in these pages, that, without being any kind of Luddite, how glad I am that, unlike the old joke about the state-motto on the Connecticut licence-plate, ("The second "c" is silent"), the second "c" in CCA proudly proclaims Cartography.[3]

Moreover, I have been teaching the subject more years than I care to remember, and even have a diploma in cartography that has (scream) just celebrated its 35th birthday. I *should* know where it all started. Thus, I have to confess, that as far as "cartography" goes, my curiosity about the origin of the term makes me fall rapidly into the word-buff category. This, of course, makes the purity of my earlier arguments look a little tarnished. But, perhaps not: maybe it *is* possible to have one's cake and eat it. Not to treat the chronological "markers" as being different from the "organic" development issues, but to see them as part of a connected concern.

John Wolter, is a useful point of reference here. His "emergence of a discipline" argument, the platform of his 1975 Ph.D., was concerned with how map-making achieved enough critical mass; that is, intellectual and practical coherence; to transform itself into "cartography".[4] He starts off, however, with a common notion: that "cartography" (as the French, "cartographie") was a new word coined by the Portuguese historian, Viscount de Santarem. The Viscount, in fact, claims as much, in a letter dated 8th December 1839. A year later, Wolter claims, it makes its first appearance in English.

continued next page

Could cartography be only 162 years old ? The word is so familiar, that this claim for its relative youth comes as a surprise to most people, but most especially to those in the mapping business. Indeed, my reaction was to be both very surprised *and* just a little dubious. I made a mental note, to look into it a little further, 'some time' in the future. This, inevitably, turned out to be many years later. In 1991, in fact, when I was at an NEH seminar at UCLA. Here, in my free time, I was able to wallow in the resources of their amazing library.

An hour or so hunting through old numbers of the *Bulletin*, of the French Geographical Society, soon turned it up in an issue of 1838 – a year before Santarem's written claim. More time spent with etymological dictionaries pushed it back still further: "cartographie" and "cartographique" in 1832, "cartographe" in 1829. Small triumphs, indeed ! But significant ones for the emergence argument. We can safely assume, that to be afforded official dictionary status, they must have been have been in use several years earlier. Further, the word is, obviously, not just a word alone: it is a *word-idea*. This is where fun-with-words becomes much more than a low-order obsession.

If we are concerned with refining the historical and intellectual setting of the transformation of mapping-into-cartography, then the change in vocabulary is a key-point. These terms were not handed down with the Ten Commandments: they emerged under the prompting of a myriad of social, technological, and intellectual pressures. They evolved, leaving a number of evolutionary dead-ends behind: witness, "chartography" and "cartology", and the numerous attempts to rename surveying, before we came up with the less-than-mellifluous, "geomatics".

But geomatics, like other recent terms, has at least one advantage: it is *recent* and its appearance can be copiously documented.[5] The conceptual roots of cartography, albeit "only" a couple of centuries old, are harder to trace. John Wolter made an admirable first foray, but it was over 25 years ago, and in a new era when "The Death of Cartography" can be proclaimed, as at a recent AAG meeting, his approach could be usefully re-examined. Starting, of course, with that annoying burr under the cartographic saddle; exactly when did the term, "cartography", come into use. And that, as Kipling, would have said, seems to be another story....[6]

References

1. Simonett, David, "The Development and Principles of Remote Sensing", *The Manual of Remote Sensing*, Second Edition, 1983), Volume 1, records this take on the origin of the term on page 1. An on-line source on remote sensing, Nicholas Short, credits Ms. Pruitt but pushes the date back to the 1940's. Some further clarification is obviously needed.

2. Whitmore, George D. and Thompson, Morris, (1966), *Manual of Photogrammetry*, Third Edition, "Historical Background", cites Meydenbauer on page 4.

3. This is something that I touched upon in "Cartography: Some Late Night Reflections": *Cartouche* #40, Spring, 2000, pp.5-6

4. Wolter, John, (1975), "*The Emerging Discipline of Cartography*", Ph.D. dissertation, University of Minnesota, xii, 345 pp. The Santarem primacy is cited (? copied) elsewhere, most notably in Wallis, Helen M. and Robinson, Arthur H., (Eds.), *Cartographical Innovations. An International Handbook of Mapping Terms to 1900*, (1987). Map Collector Publications/International Cartographic Association, p.xvi.

5. A good discussion of the evolution of a mapping discipline is given in Forseman, Timothy, (Ed.), *The History of Geographical Information Systems. Perspectives from the Pioneers*, (1998), Prentice Hall, pp.3-5.

6. My interest in this area was recently awakened from its decade-old dormancy by Francis Herbert at The Royal Geographical Society, who has been doing some parallel investigations, and with whom the original UCLA investigations were earlier shared.

Book Reviewers Needed

Below is a list of books that *Cartographica* has received for review purposes. If you are interested in writing a review of one of these titles, please contact:

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First time reviewers are always welcome.

Photographing Canada from Flying Canoes, by S. Bernard Shaw, Burnstown [Ontario]: General Store Publishing House, 2001, 294 pp.

Seeing Through Maps: The Power of Images to Shape Our World View, by Ward L. Kaiser and Denis Wood, Amherst [Mass.]: ODT Inc., 2001, 152 pp.

Qing Colonial Enterprise: Ethnography and Cartography in Early Modern China, by Laura Hostetler, Chicago: University of Chicago Press, 2001, pp 257.

Image and Reality: Jerusalem in Maps and Views, by Rehav Rubin, Jerusalem: Hebrew University Magnes Press, 1999, 181 pp.

Bushmander and Bullwinkles: How Politicians Manipulate Electronic Maps and Census Data to Win Elections, by Mark Monmonier, Chicago: University of Chicago Press, 2001, 208 pp.

Weldon Hiebert
University of Winnipeg

Those were the Days
Reflections of Past Technologies (Part 1)

For more than thirty years the University of Winnipeg cartography office produced maps for the Geography Department in particular and for the university community overall. For more than twenty-five years students hunched over drafting tables applying the theories and methods of map design on paper. Earlier this year the cartography office finally fell victim to changing technologies and to an expanding university running desperately short of usable space. The loss of the cartography office came as no surprise. Students exchanged drafting tables for computer workstations in another part of the department. Most of the equipment became obsolete as I plied my trade on my own workstation in a small corner of the office. Even my darkroom was replaced by a single graphics package.

Moving to a new office did not bother me as much as the arduous task of sorting through the 30+ years of cartographic work produced here by myself and my predecessors. Equally disturbing is the fact that I would not have the space to keep it all. A lot of these maps would have to be stored elsewhere or thrown away. Always looking for the silver lining, I thought this would be a suitable start as chair of the Map Technology Production Interest Group, reflecting back on past map production techniques. For those of us who remember the manual and mechanical methods of map production, this will be a time to reminisce about the "good ole days." For those raised on Windows or the Mac, it will be a short history lesson.

The oldest maps I found in the office predated my tenure as cartographer but the production methods were all too familiar. These relatively simple maps were produced mainly with pen and ink. Text was created with an Alpha or Leroy lettering set. The Leroy lettering set consisted of a template of characters and a scriber. The template was etched with letters of the alphabet (upper and lowercase), numerals and common punctuation marks. The scriber consisted of a tracing stylus in one end and a drafting pen or pencil in the other end. The scriber was similar to a pantograph as the tracing stylus followed the groove of the etched letter and the pen or pencil would trace the character on print media. The lettering set included various templates of different character heights. All templates had the same font style but adjusting the distance between the tracing stylus and the pen created italicized letters. The template must be used against a straight edge to ensure correct alignment. Non-aligned words, like following the course of a river, for example, were difficult to do. The lettering set was popular because it was inexpensive. As long as you had a drafting pen and ink you could produce any number of characters.

My first experience with the lettering set was as a student in the introductory cartography course. There we were, a room full of cartographic novices trying to master the intricacies of the lettering set. We spent many hours perfecting our skills with such phrases as "the quick brown fox jumps over the lazy dog." This phrase was used because it contained all the letters in the alphabet. The many blasphemous mutterings under our breaths attested to our difficulties in trying to master this task.

Fortunately the use of the lettering set was short-lived. Other methods of lettering were far superior particularly photo-typesetting and dry-transfer lettering. Most of the maps produced by the cartography office were of these types. Interestingly, because of the cost factor, the Leroy lettering set continued to be the primary method of text production in the introductory cartography course until the mid 1990s when the course was discontinued.

As the name implies, the photo-typesetter produced type photographically. A light source shone through a template consisting of a particular type face, or font, and exposed the type onto a sheet of photographic paper or film. The paper or film was developed and the words were cut out and pasted onto the map. The photo-typesetter offered the cartographer a variety of font styles not available with the lettering set. Also, every letter and character had a consistent look to it. Like the lettering set, the cost of producing text was relatively low.

The main drawback with typesetting was that typed text was not seen until the film or paper was developed. Great care was needed to keep track of your progress. I usually crossed out or highlighted every word typed. Typesetting was compounded by interruptions such as phone calls or knocks at my door, both of which seemed more frequent every time I settled in for some text production. Invariably I would lose my place and retyping was necessary. Our photo-typesetter was a monstrosity called the Marisawa Electa. With the Electra, the film is placed on a roller in a light tight cartridge on top of the machine. Like a typewriter, the roller is advanced when the type reaches the end of a line. Once I forgot to latch the mechanism that allowed the roller to advance. I spent a couple of hours typing text all on the same line! Worst of all I could not discover my mistake until the film was developed. After a very long break to "calm down," it was back to the old drawing board but with more care involved. The Electra also made

continued next page

an annoyingly loud "clackity-clack" sound when the shutter was pressed to expose a letter or character. Everyone within a ten-office radius knew what I was doing. I could not do the job quietly.

By far the most popular method of text production in the cartography office was dry-transfer lettering. Characters were transferred to the map surface by rubbing them off the face of the carrier sheet using a burnishing tool or ballpoint pen. Dry-transfer lettering had many advantages. The characters were of high quality and had a consistent look. Text could be easily placed anywhere and at any angle on the map. This worked well for applying names along paths such as rivers. Since characters were applied directly to the map surface, the results were viewed immediately. Various companies produced dry-transfer lettering offering a seemingly unlimited variety of font styles and sizes. Dry-transfer lettering also had its drawbacks, the main one being cost. The sheets of letters and symbols were not cheap and usually ate up about 25-35 percent of my budget. Each sheet had a limited number of characters and when a particular letter was gone you had to reach for a fresh sheet of letters. I always ran out of the letters "m" and "w." There were never enough of these letters as "Winnipeg" and "Manitoba" were among the more popular words used. A map with many place names on it or paragraph text made burnishing of characters a slow and tedious process. Here the photo-typesetter was the method of choice. Nevertheless, dry-transfer lettering remained the choice for text production.

The evolution of shading patterns for choropleth maps paralleled that of text. I came across a few examples of shading patterns drawn with pen and ink. These types of choropleth maps were simple but, if drawn properly, they could be quite effective. A series of horizontal, vertical, diagonal, or crosshatched lines were drawn to represent shading patterns. Crosshatched lines were usually drawn at fixed angles as determined by the choice of set square used to produce the pattern. The more popular angles were 30°, 45° and 60°. Line thickness and distance between the lines determined the density of each pattern. Pen and ink worked well if the map was kept simple. Overlaying text, point symbols and linear features on crosshatched patterns cluttered the map and made it difficult to read.

Crosshatched patterns did not offer much variety. Self-adhesive sheets, on the other hand, offered the cartographer a variety of shapes and styles similar to dry transfer lettering. Self-adhesive sheets of various sizes and densities of line and dot patterns were printed on the reverse side of transparent adhesive acetate sheets. A self-adhesive sheet would be placed on top of the map surface and a sharp blade traced along the boundary of the area on which the pattern would appear. Enough pressure was applied to the sheet so the blade would not cut through to the map surface. The cut sheet was carefully removed and placed on top of the map surface. The adhesive kept it in place. Like dry-transfer lettering, the quality of the pattern sheets was consistent and of high quality. With lighter tints, patterns could be placed over other aspects of the map, such as text and linear features, and remain legible. For cutting of the self-adhesive sheets, I found that a surgical blade worked best. Surgical blades were thin and very sharp, always a clean cut through the sheet. Also, surgical blades made relatively painless incisions in the fingers, though blood did not make a good pattern. Self-adhesive sheets worked well with straight lined or smooth curved polygons. Irregular shaped polygons were another matter. Nothing made me twitch more than the prospect of having to trace a cut around the coastline of Canada. So many twists and curves, resulting in lots of blood, sweat and tears (literally and figuratively). I am no masochist; I used a photographic method involving acid etching to produce the patterns for irregular polygons.

"...surgical blades made relatively painless incisions in the fingers, though blood did not make a good pattern."

With acid etching, a caustic developer was used to etch the outline of the map onto a sheet of film known as stabilene. A negative of the map was placed in contact with the stabilene, emulsion to emulsion. The combined sheets were then exposed to a light source and the developer "dissolved" the exposed areas producing a stabilene negative identical to the original. From this new negative the areas within the map were peeled away leaving a transparent region for pattern exposure. Each sheet of stabilene would then represent a specific pattern type. The original map negative was used to make as many stabilene negatives as the need required. No longer did I have to fear the coastlines of Canada or Norway. The light source used in this production was a carbon arc. Two carbon rods were place millimeters apart and an electrical current flowed through them. The reaction resulted in brilliant flash of sufficient intensity to make an exposure. Unfortunately dangerous carbon fumes were a side product. This was deemed a health hazard and eventually the carbon arc was shut off permanently. Not wanting to revert back to the surgical blade, I needed to find a light source bright enough to make the exposure. Luckily for me the answer was just outside my front door. I was able to get the results I needed by exposing the stabilene to sunlight and get a great tan in the process.

Most maps produced in the cartographic office found their way into the darkroom. Here the finishing touches were applied to turn the drafted map into a presentable format. Whether it was a transparency for classroom use or "camera ready" for publication, it was all done in the darkroom. Cleaning out the darkroom was difficult for me as this was my favorite part of my job. I enjoyed the photographic process, the production of negatives, the exposures and the waiting with bated breath as the final image slowly appear on film or paper. But most of all, I enjoyed the solitude the darkroom afforded me. Once the safelight was turned on, I was unapproachable. When someone knocked at my door I could gleefully yell "I'm in the darkroom!" I didn't even mind the smart

comments. "Let me know what develops" or "don't expose yourself too long" didn't bother me. The darkroom became my sanctuary.

Production of the final map in the darkroom was done either by contact photography, permanent mount transfer or a combination of the two methods. With contact photography the negative came into direct contact with a sheet of positive paper or film. The two sheets were pressed firmly together, normally in a vacuum frame, but in my case with a heavy piece of glass. An exposure was made and the paper or film was developed to produce the final image. Depending on the complexity of the map, there could by any number of contact negatives applied to produce the final image. Each negative represented a certain aspect of the map. Screens could be inserted between the negative and the positive to produce map patterns or any other shading required. All the negatives had registration marks and were hole punched to ensure proper alignment. Each negative had to be exposed separately. It was important that the map was error free. Any errors meant that a correction was necessary and the whole process had to be done again. Editing the final draft was essential though this did not prevent further problems. It was not unusual for changes to be made to the map after the fact, or a misspelled word went unnoticed. Once I had to produce the cover page for the abstracts booklet for a conference we held. In big bold capitalized lettering I had spelled "ABTRACTS." The error went unnoticed until three days before the beginning of the conference! Fortunately there was enough time to fix the error and it gave me a chance to retreat once again into my darkroom.

With permanent mount transfer the original map was photographed onto a sheet of negative paper and then chemically transferred to a sheet of positive paper or transparency film. Both negative and positive were submerged into a tray filled with a developer and then pressed together, emulsion to emulsion through a roller. After about a minute the negative was peeled away producing a 'permanently mounted' image of the original map. This method was fast and produced a high quality 'camera ready' image. The best part about permanent mount transfer was that it was scalable. A map could be enlarged up to 400% or reduced down to 25% of its original size. Maps drafted at any size could be scaled to fit the page dimensions of any journal or book. I always drafted maps with reduction in mind. Photo-reducing the map produced a crisper, sharper image. Also, any errors or flaws would be reduced as well.

Though computer mapping has been around for nearly as long as the cartography office, traditional methods continued to dominate map production. The early days of computer mapping could not produce the same quality output as traditional techniques. But computer technology was rapidly expanding and every year the quality of computer drawn maps was improving. The domination of traditional methods in this office lasted until the personal computer became affordable and improved graphics software and high quality output devices radically changed map production techniques. With these improvements in computer technology, the demise of traditional production techniques was as sudden as the extinction of the dinosaur. In the next issue of Cartouche I will reflect back on the early days of computer mapping in the cartography office, the problems associated with map production and quality output, and its eventual dominance.

FINAL RESULTS OF THE 2001 MAPublisher Map Competition.

Avenza Systems Inc. of Mississauga, Ontario, Canada, the developer of **MAPublisher®**, is pleased to announce the final results of the **2001 MAPublisher Map Competition**.

Over 40 maps were received in 8 categories all of which displayed excellent MAPublisher use and knowledge as well as tremendous cartographic skill. It is unfortunate that we could only select a few winners and one overall "Best Map". Indeed the adjudication process was quite difficult. The Grand Prize winner and First Place category winners are listed below:

Grand Prize Winner and winner of the General Purpose Category:

"Official Map of Louisiana 2000", Louisiana Geological Survey, Baton Rouge, LA

Academic (Individual) Category: First Prize Winner:

"Scotland - Splendour and Beauty", Jeff Marshall, Sir Sandford Fleming College, Lindsay, ON

Geologic Category: (tie)

"Geologic map of the Grand Canyon 30'x60' quadrangle, northwestern Arizona", USGS, Denver, CO

"Muravera", Debora Graziosi, Earth Sciences Department -University of Siena, Siena, Italy

Multimedia Category: (tie)

"JS Latvija", Gvido Petersons, Jana Seta Map Publishers Ltd, Riga, Latvia

"XYZ Birmingham CityMap CD", The XYZ Digital Map Company, Glasgow, Scotland

Special Purpose Category:

"Nord-du-Québec - Nunavik - Baie-James", Catherine Lessard, KOREM, Quebec City, PQ

Thematic Category:

"Santa Rosa Sketch Plan B", Mark Chambers, Dyett & Bhatia, San Francisco, CA. Author: Mark Chambers

Topographic Category:

"Sangre de Cristo & Great Sand Dunes", Kent Schulte, Sky Terrain, Boulder, CO

Transportation Category: (tie)

"Montana 2001-2002 Highway Map", Ed Madej, Tetra Tech EM Inc., Helena, MT

"South-east Zeeland bikemap", Hans van der Maarel, eXQte, Klundert, The Netherlands

The complete list including honourable mentions and details of each map and the associated images can be found on the company's website at **http://www.avenza.com/MPcomp/2001.** All questions may be sent to competition@avenza.com

Don't Forget GIS Day November 14, 2001

GIS Day is a worldwide grass roots event that formalizes the practice of geographic information systems (GIS) users and vendors of opening their doors to schools, businesses, and the general public to showcase real-world applications of this important technology. The event is principally sponsored by the National Geographic Society, the Association of American Geographers, University Consortium for Geographic Information Science, the United States Geological Survey, The Library of Congress, and ESRI. For more information see *www.gisday.com*

We at the CCA would like to hear from you about your GIS Day. If you were involved with or sponsored a GIS Day event and would care to do a short write-up about it I would like to publish it in *Cartouche*. This could be a good way to let others know what's going on in your part of the world. Send your submissions to Gary McManus, editor; *Cartouche*; 101-1550 W. 11th Avenue; Vancouver, BC, V6J 2B6; or email to *gemcm@shaw.ca*

CCA AWARDS

The Canadian Cartographic Association presents several awards each year to deserving members of the cartographic community which it serves. These awards are meant to recognize and encourage the achievements of outstanding individuals in the field.

- **President's Prize Student Map Competition** ($100 prizes in several categories) The details for the **2002 entry** form can be viewed and downloaded from the CCA web site at *www.geog.ubc.ca/cca/pres_prize.html*. All entries must be delivered to Waterloo before Friday May 17, 2002. Entries should be sent to: President's Prize, Canadian Cartographic Association, Department of Geography and Environmental Studies, Wilfrid Laurier University, 75 University Avenue West, Waterloo, Ontario N2L 3C5

- **Norman Nicholson Memorial Scholarship in Cartography** ($500 scholarship) To recognize and encourage exceptional student achievement and ability in any aspect of cartography.

- **Awards of Distinction** To acknowledge exceptional professional or scholarly contributions to the field of cartography or an exceptional contribution to the Association.

For information about eligibility and how to apply or nominate individuals for these awards see the CCA web site: *www.geog.ubc.ca/cca* or contact any member of the executive.

Prix de l'ACC

L'Association canadienne de cartographie présente, à chaque année, plusieurs prix à ses menbres méritants. L'attribution de ces prix a pour but de reconnaître et d'encourager l'accomplissement exceptionnel d'individus dans le milieu cartographique.

- **Le prix du Président pour la compétition des étudiants** (Des prix de $100 pour différentes catégories.) Les détails pour la feuille d'inscription 2002 peuvent être vus et téléchargés du site Web l'ACC à *www.geog.ubc.ca/cca/pres_prize.html*. Toutes les entrées doivent être livrées à Waterloo avant vendredi, le 17 mai 2002. Les entrées devraient être envoyées : Prix du Président, Association canadienne de cartographique, Département de Géographie et Études Environnementales, Wilfrid Laurier Université, 75 Ouest d'Avenue d'Université, Waterloo, l'Ontario N2L 3C5

- **Bourse Norman Nicholson** (Bourse de $500) Bourse attribuée afin de reconnaître et d'encourager un étudiant pour son accomplissement exceptionnel et ses capacités dans tous les aspects de la cartographie.

- **Prix de distinction** Prix pour reconnaître les contributions professionelles ou académiques exceptionnelles dans le domaine de la cartographie ou pour une contribution exceptionnelle à l'Association.

Pour de plus amples renseignements concernant l'éligibilité, comment postuler ou proposer un candidat pour ces prix, s'il vous plaît, veuillez visitez le site web de l'ACC à l'adresse URL suivante : *www.geog.ubc.ca/cca*, ou veuillez contacter un membre du comité exécutif.

The Canadian Cartographic Association
L'Association canadienne de cartographie
www.geog.ubc.ca/cca

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The CCA was founded in 1975 to promote interest and education in maps and cartographic data, and to provide for the exchange of ideas and information, at the regional, national, and international levels, via meetings and publications. Membership in the Canadian Cartographic Association is open to all individuals, and public and private institutions which have an interest in maps and the aims and objectives of the Association. Membership is available in the following categories at the annual rates listed below ($CND):

Regular	$80
Student	$40
Institutional	$100
Corporate	$200
Family	$95
Retired	$40
Associate	$40

To cover mailing costs US residents please add $5 CDN and Overseas residents please add $10 CND to the appliciable membership catatgory.

Members receive the quarterly journal *Cartographica*, published by the University of Toronto Press and endorsed as the journal of the CCA; four issues of *Cartouche*, the CCA newsletter and the International Cartographic Association Newsletter. The Association also provides an annual conference to promote discourse and access to a range of expertise through the interest groups and regional contacts.

For further information about membership qualifications and benefits contact the membership coordinator or any executive member or visit www.geog.ubc.ca/cca

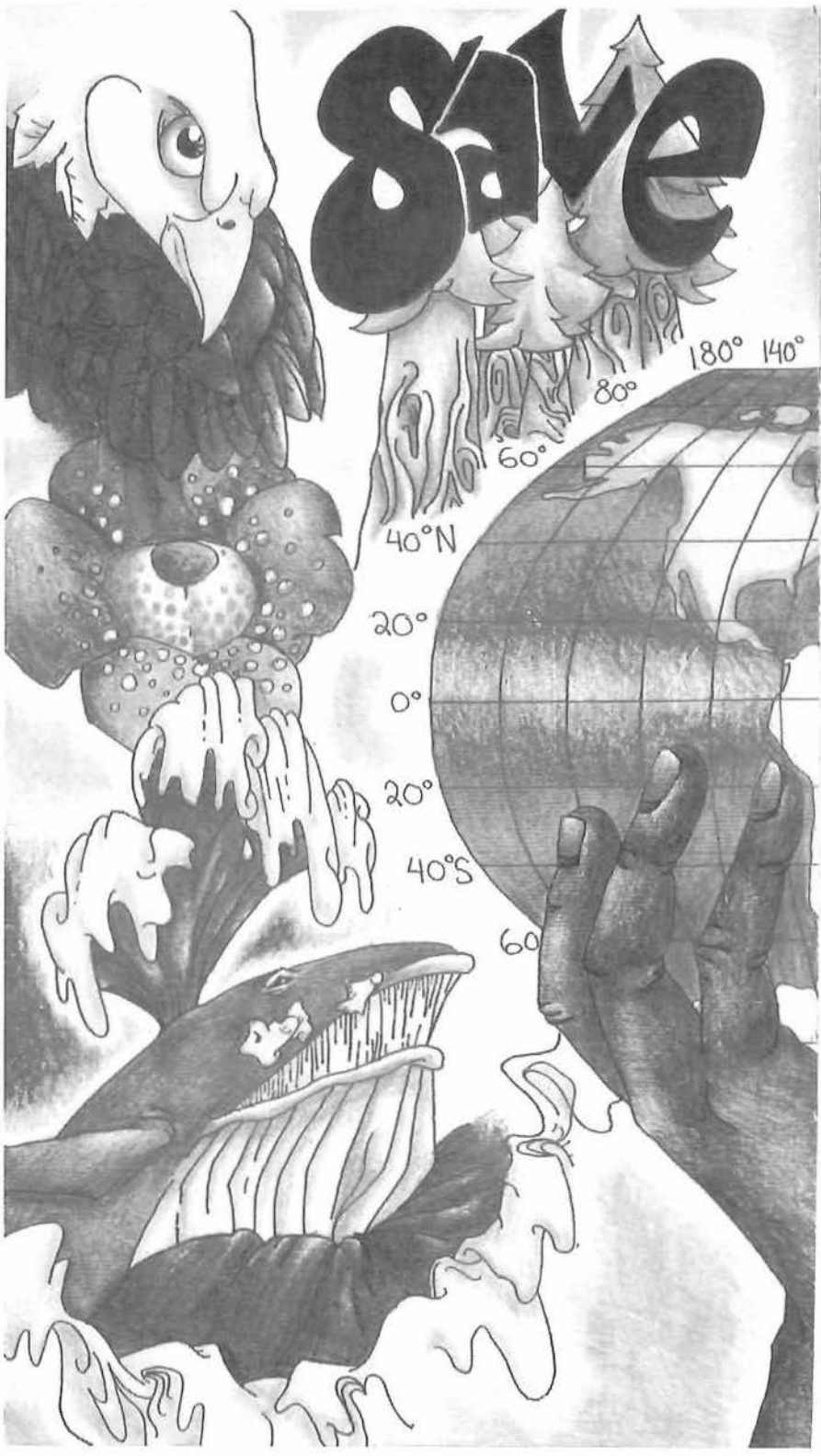
L'ACC a été créé en 1975 pour promouvoir les intérêts et l'enseignement des cartes et de la cartographie ainsi que pour permettre l'échange d'idées, d'informations tant sur les plans régionaux que nationaux et ce via des bulletins et des conférences. L'adhésion à l'association est ouverte à tous les individus et institutions (privées et publiques) qui sont intéresés par les cartes et par les buts et objectifs de l'association. Vous pouvez adhérer dans les catégories suivantes selon les taux indiqués (cdn$) dans la liste ci-dessous :

Régulier	$80
Étudiant	$40
Institutionnel	$100
Société	$200
Famille	$95
à la retraite	$40
Associé	$40

Un montant de 5$ (cdn$) est ajouté pour couvrir les frais postaux aux membres américains (É-U) et de 10$ (cdn$) pour les membres outremers.

Les membres recoivent la monographie trimestrielle Cartographica, publiée par le University Toronto Press; 4 numéros du bulletin de nouvelle Cartouche et le bulletin de nouvelle de l'Association cartographique internationale (ACI). L'Association organise également une rencontre annuelle avec des conférences qui donne accès à l'expertise issue des groupes d'intérêts et des diverses régions du pays.

Pour plus d'information concernant l'adhésion et les bénéfices de l'association, contactez le coordonnateur des adhésions ou l'un des membres de l'exécutif ou encore, visitez notre site Internet *www.geog.ubc.ca/cca*.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