

**Giuliano Bellezza, Geography, Geomatics, Culture**

**Paper presented in the “International Conference on Land use cover change, Biodiversity, Climate Change”, Marthandam (Tamil Nadu), 6-10 October 2008.**

This paper is a follow up of the one I presented in Hyderabad, during the first International Congress of the National Association of Indian Geographers (*Is it possible to see intangible culture in the land?*). In that occasion I tried to answer to the question "*Does Culture appears in Satellite Images?*", and commenting the image my answer was "yes, it is". My positive answer can be seen in the comment to the photo #3 of the aforementioned paper. Briefly, in an imagine along the Canada-USA border (49° parallel N) was clearly seen not only that the territorial organization is different in the two States, but that this organization was influenced by the uses and habits of the French and British colonizers: the land properties were organized in the first case with long stripes, while squares were the only figure appearing in the second.

So I went on examining all the Canada-USA border, with the help of Google Earth, and I could make many new observations. Today the opening question of my paper is: "*Does Cultures influence land cover organization ?*". I had to change my first, too simple, conclusion: it always happens when we observe closer the results of human action. Let's see the first image, taken in the eastern part of the two States, where English and French colonization began.



Marysville (42°54'40" N and 82°28'52" W) is a small town in Michigan (USA), in a square organized territory, totally different from the land organization on the opposite riverbank, (Ontario State, Canada). It is exactly what I expected to see, but things changed when I began moving westward, along the USA-Canada boundary, which runs for more than 2000 km following the 49° parallel N. In the second image the latitude is about 112° W, and what can be seen are Alberta (Canada) north of the border, Montana (USA) south of it.



The situation is nearly the opposite of which could be expected: long stripes in the USA, shorter and wider stripes in Canada, where is clearly detectable a tendency toward a square organization. As a general rule, what one can read in these geomatic images depends on the variety of known "alphabets". The experts in geomatics can read many specialist *alphabets* unknown to geographers, but vice versa holds true also. Now we should look with geo-historical glasses. In the eastern part of the border the settlers were mainly of British or French origin, but the situation was changing when the European began moving more and more away from the Atlantic Ocean. In fact, soon after the Independence War, many US settlers, still loyal to the English Crown, moved to Canada, finding new earth in the central (and obviously southern) part of the enormous, wide but cold spaces, where very few French people were still arriving. Things were changing even in the US sector, where after the Civil War a significant percentage of immigrants were now coming from central and eastern Europe: in the plains all these people were more used to cultivate in long rectangular fields. So I arrived to the third question: "*Does reciprocal cultures influence economy and land cover organization?*". The right border to look for an answer starts from the second photo I showed in Hyderabad, and published in the **citare il primo articolo**. A Landsat image of the early '70s showed that the "industrial" US, north of the border, were largely cultivated, while no vegetation appeared on the southern side, in the "agricultural" Mexico. The explanation was simple, more economical than cultural: on the southern edge of the border thousands of Mexican *braceros* (unemployed countrymen, searching works of any kind) were waiting the right moment to illegally cross the border, to find an irregular work in the fields; they were earning a pittance of pay, on US standards, but nevertheless this was much higher than the normal Mexican one. The bonanza couldn't last more than some months, before being discovered and forcibly sent back to Mexico, but saving a good amount of money in the pocket. After some days it was time to go once more near the border, waiting for the good moment to cross it again.

Some dozens years passed by, and when, still thanks to Google Earth, I made a new "flight" on the border, once again I could read many things the geomaticians usually neglect. Important changes occurred in the time passed, due to the NEFTA Treatise, among USA and many States of Latin

America and, even more, to the USA-Mexico agreement about the *Empresas maquiladoras*. A *Maquiladora* is a factory that imports materials and equipment on a favoured basis for assembly or manufacturing a product, which must soon after be re-exported, usually back to the originating country.

Going back in time, the first agreement to allow the Mexican *braceros* to enter in the USA as temporary workers had been signed during the '40s, due to some scarcity of unskilled workers in the US, where many people were requested in the Army all over the world. In the '50s the USA stopped this kind of migration, but it continued in illegal way, until a new agreement was signed. A *Maquiladora*. is a factory that imports materials and equipment on a favored basis for assembly or manufacturing a product, which must soon after be re-exported, usually back to the originating country.



US firms were very rapid in understanding how many advantages they could take from the system. *Maquiladoras* headquarters were established near the border, exporting semi-manufactured products in Mexico with US firms were very rapid in understanding how many advantages they could take from the system. Headquarters were established near the border, exporting semi-manufactured products in Mexico at no custom fees, paying the assembly much less than it would have been in the US, re-importing the final product to sell it, possibly writing in the label "product in the US". Soon, many firms of Japan, Germany and other Asiatic and European Companies established headquarters near the USA-Mexico borders, and this caused a rapid increase in the industrial activity on the Mexican side. Knowing this *alphabet*, and thanks to Google Earth, all this can be easily read.

In the early '80s Tecate (above) was a little village south of the border, some 45 km from the sea; in a few years it grew to an industrial town, while in the US part of the image we can see only vegetation, not much cultivated. This is one of the best examples of the land cover and organization changes along this border.

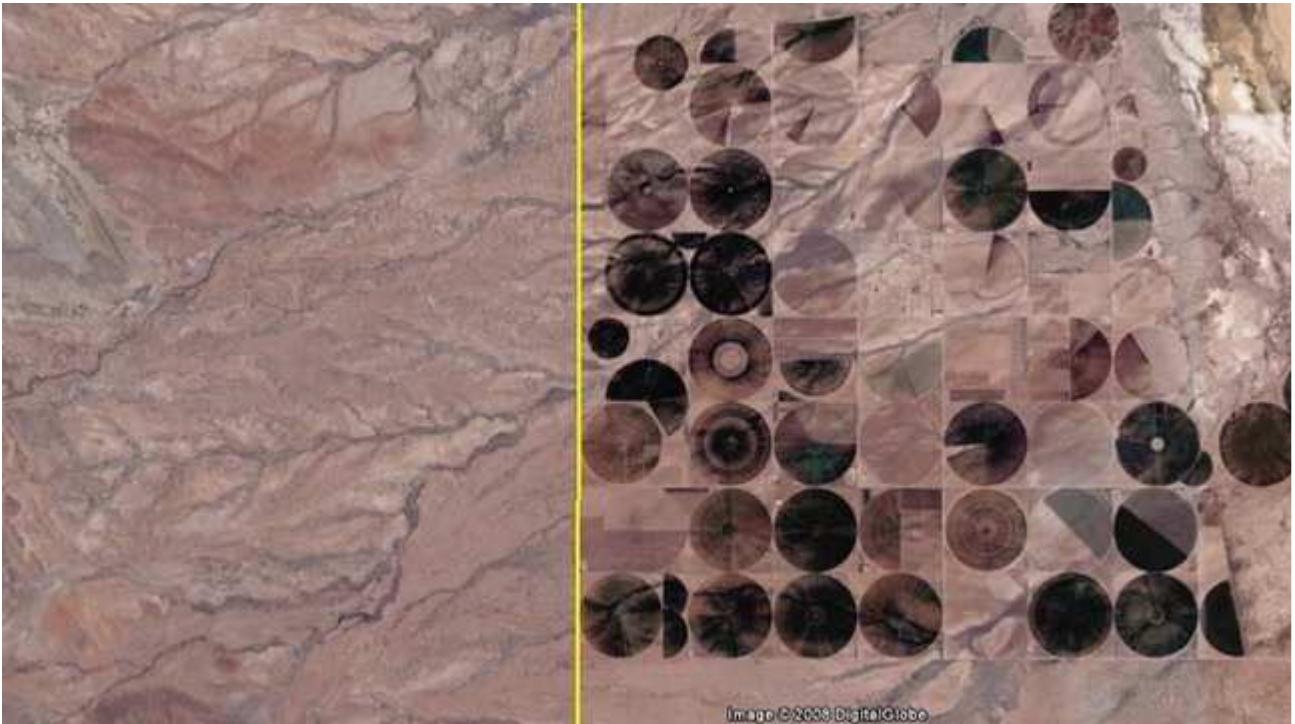


The figure above shows another kind of change. Here we are about 100 km more inland with respect to Tecate. The border is a few km south of the large irrigation scheme named Imperial Valley: a huge amount of water were heaped beyond the border, causing salinization of many square miles of Mexican land, causing never ending international dispute. The situation was strongly modified by the *maquiladoras*. Mexicali had about 250.000 inhabitants in the '70s, 500.000 in the '90s and nearly 900.000 today.

There are now some cultivation west of the city, but compare the order of the fields: always geometrically oriented in the grid system of the US, while in the Mexican side we see some geometrical tendency, but more influenced by fantasy. Here the land cover and use changes are very influenced by both economy and culture.



Yuma is a city about 220 km far off the Pacific coast. Here the USA-Mexico border changes abruptly, from E-SE/W-NW direction to N-NE/S-SW. Here it appears to have been no changes: totally cultivated the US side, largely barren arid land on the Mexican one. Until now the lecture of the images showed some changes, all of them rather easily explained by my *alphabet* knowledge; but in the next figure I found something unexpected. It is in an anonymous location, about 800 km from the Pacific coast, but only 460 from the Bay of Baja California.



The boundary is a thin vertical line, separating a barren desert land and richly cultivated fields, with large use of central pivot irrigating systems. The diameter of the circles is 1 km, and this appears strange, in a State where the length is still measured in terms of feet, yards and miles. In fact, the surprise increases when we discover that the barren land is in the US side, and the irrigated fields are in Mexico. There are two possibilities: a) some rich US citizen (or Japanese, Canadian or else), knowing about a very large underground water table, bought at low price a large property in Mexico and excavated the wells for the irrigation; b) the rich family is a Mexican one, and probably its richness is based on some *maquiladora* factory.

And here comes the most important lesson for a geographer. What we have seen is an as interesting as easy way to look at the world and, based on the known *alphabets*, we can make intelligent observations and hypothesis. But we should be very aware of the risk to make trivial mistakes: we will never know what is going on in some territory unless we go there, and spend the due time seeing with our eyes and speaking with the people, trying to learn their culture, so to read with their interpretative *alphabets*.

Now look at the next figures: the time has arrived when the speaker should give space to the audience. Please, use all of your attention, because you know the next local *alphabets* far better than I will ever do. All these images show territories along the boundary between India and Pakistan, and more precisely a part of the political border between the two Punjab.



Geographical references: Latitude about  $30^{\circ}$  N, Longitude between  $73^{\circ}37'$  and  $73^{\circ}45'$  E. One feature is easily read, as it is written in universal alphabet: the border is clearly indicated by the limit between the totally cultivated area in India, and the desert, with small cultivated spots in Pakistan. The yellow line appearing in the image parallel to the limit of cultivations, marked in Google Earth as political boundary, is not at all what it pretends to be. We can't blame Google Earth for this: when drawing maps of the whole earth mistakes of less than 140 metres are absolutely normal. In any case there is a lesson to learn: one should never forget that, notwithstanding the continuous advancement of technology, we are still far from perfection. On the other hand, remember that the possibility to see these images in a laptop is close to a miracle. The second image between Punjabs (below) shows the same characteristics: land totally cultivated in India, plain desert in Pakistan, but the general aspect seems to be different between the two images. You probably know that in Google Earth it usually appears the date of the survey, which is updated when a new image is available. The first image was realized in 2003, when the field were fully covered by the ripening crops; the second, distant some 18 km, was taken four months later, after the harvest (and here also the border is marked with an error of about 200 metres).



I am convinced that the human settlements are an issue of basic importance for the geographical researches, if not the key one. I want to drive your attention to the settlement in the bottom-right corner of the image: something so important, in my opinion, to show it enlarged in the next image.



I don't know the name of this village, but its plan appears different from all of the nearby ones. As far as I have seen in India, the majority of the rural villages have a nearly square plan, where small streets intersect with right angles. Here we see a very different plan, something that in western architecture will be called a star plan. My first thought went to Chandigar, the capital city of Punjab, whose plan was drawn by one of the main architects of the 20th Century, the Swiss-French Le Corbusier: as a matter of fact, a large part of Chandigar, east of the airport, has a star plan. But this is an enlargement of the city, not part of the first planning (which, on a larger scale, is similar to the one of the Indian rural villages), and I had to give up.

So, now I finish, leaving the floor to you, with a strong desire: I wish that some young Indian geographer, after a survey in Google Earth (or similar software), will go on the field, to see and speak to the people. I am longing to read the results of a field survey about the different land use and changes along the border of the two Punjabs (and along all the India boundaries), with special attention to the human settlements. This is what geographers should do: practical surveys and, if necessary, give suggestions to modify the land use and cover, thus showing the wide possibility of the professional geographers in improving the men-environment relations.