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The Compendium*

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Let but Eternity look, more or less visibly, through the Time-Figure!

- **Thomas Carlyle**

* *Compendium*... "giving the sense and substance of the topic within small compass." In dialing, a compendium is a single instrument incorporating a variety of dial types and ancillary tools.

A Beautiful Spiral Dial in Québec:

A New Case Study in *Aesthetics* and *Gnomonics*

André E. Bouchard (Outremont QC)

Books are the best of things, well used; abused, among the worst. What is the right use? What is the one end, which all means go to effect? They are for nothing but to inspire. - Ralph Waldo Emerson. in The American Scholar, *An Oration delivered before the Phi Beta Kappa Society, at Cambridge, August 31, 1837.*

I am here today to express my joy and gratitude in receiving the "Sawyer Dialing Prize for 2013."

Thank you very, very much! It is an honor and a recognition of the work of all the *architects of sundials*, especially those who are working quietly at their desk or in a public library. After a short career as a college teacher, I chose to work in a private company in the field of research in communications, rather than to continue in a job as an academic. The objective "*Publish or Perish"* was not an alternative suitable for my character!

But I still consider myself a scholar, that is:
- A learned person.
- A specialist in a given branch of knowledge.

I remain an "*architect of ideas* in gnomonics", because I play, study and work with philosophical theories, ancient and contemporary, in order to understand and bring forth the interpretation, or the hidden meaning behind a sundial. Going from "*Elegance to Diversity"*, I am highly influenced by the French and the British traditions of gnomonists.

The rationale of my approach

For more than twenty years, I have brought together some passionate people interested by dials. Together we have created a directory of dials, while providing a forum for the exchange of ideas, and creating new contacts and network. I have also made my own dials, and have helped groups or individuals to create their own projects of dials!

However, I quickly discovered that I most enjoyed writing and giving lectures about dials. Certainly my main activity was one of sharing my interests for dials as well as for books dealing with gnomonics. I literally devoured the rare books; I enjoyed deciphering texts and illustrations, preferring sketches and drawings to photographs of sundials. During the first fifteen years (1993-2008) of the CCSQ (la Commission des Cadrans solaires du Québec), I made numerous presentations on gnomonics, adopting objective and descriptive ways, mainly to highlight the specific elements of a particular dial or dialist.

But my role as the editor of our Newsletter, called *The Gnomonist/Le Gnomoniste*, has entitled me to rediscover one of the major intellectual sources of my academic and professional training: Philosophy! The study of the history of ideas!

So I decided to focus on a field of research that would satisfy my taste for dials, while distinguishing me from other authors on sundials.

My approach to sundials would be the following: I would try to determine the question of one "quality", found in dials: beauty. To do so, I went back to the reading of philosophers who have developed some of their reflections on aesthetics, and the idea of beauty. As I applied aesthetic theories to my understanding and my interpretation of the dials, I found beautiful specimens of art. And I have been enjoying this approach very much.

Now I would like to give you some clarifications of concepts to further explain how I use them in my writings/research.

- When I go for “beautiful” sundials, my intention is that they will be described with the help of an aesthetic theory, hoping to arrive at a symbolic interpretation of these objects.

- Let us have in mind that not all sundials meet my definition of a "beautiful dial": some are common, accurate, scholarly or complicated, some are downright ugly, pretentious, incomplete or frivolous, while others are minimalist, surreal, arrogant or boring, *etc*.

- I am not looking for one specific type of dial: rather I simply seek a beautiful or perfect sundial that responds to some determined standards of beauty.

- While I am searching for beauty in some dials, I am trying to say how and why these dials move me and teach me to become a better scholar; and why finally these dials are beautiful!

- Speaking of beauty, the beautiful and artistic conditions of these objects of gnomonics are an excellent way to look at what the philosophers say, especially for those texts or treatises dealing with aesthetics.

But looking for beauty, what a challenge! Beauty is a difficult question. I go back to Antiquity, I also look at the thinkers of Western and Eastern schools of thought. If nobody has the same definition of a beautiful design, everyone agrees that at some point an object, living or not, generates a cry from the heart: "wow ... it's beautiful, it's beautiful, it's gorgeous!" And this is where the challenge begins: we must give a satisfactory explanation of this emotion.

Just imagine how lucky I am: I have the huge privilege to be able to publish my writings in the journal *Le Gnomoniste* (4 issues per year) and to get a free use of a computer server from the Department of Geomatics Sciences at Laval University in Quebec City, also to put on the internet all of my writings and my thinking on the subject of aesthetics and gnomonics.

http://cadrans-solaires.scg.ulaval.ca/v08-08-04/mediatheque/estheti-gnomon.html

The publication of texts on the Internet allows some fast, instantaneous and universal dissemination with the possibility of feedback and great interaction.

- I choose a dial and quickly describe the characteristics of that sundial.

- I also choose a philosopher based on his explicit aesthetic theory that can best inspire me and so help to feed my thinking and writing. I read a text and take notes concerning the beauty and its unique attributes. My notebooks are full of ideas, sketches, quotes and illustrations. This is the raw material of my articles. This is my inspiration, to paraphrase Emerson!

- This process can take up to some 6-8 months for one specific analyzed dial.

- I write a first version of my text, without worrying about the style, logical paragraphs, or organization of ideas. I write whatever comes into my head. Then, the work of creating, organizing and correcting the text begins.

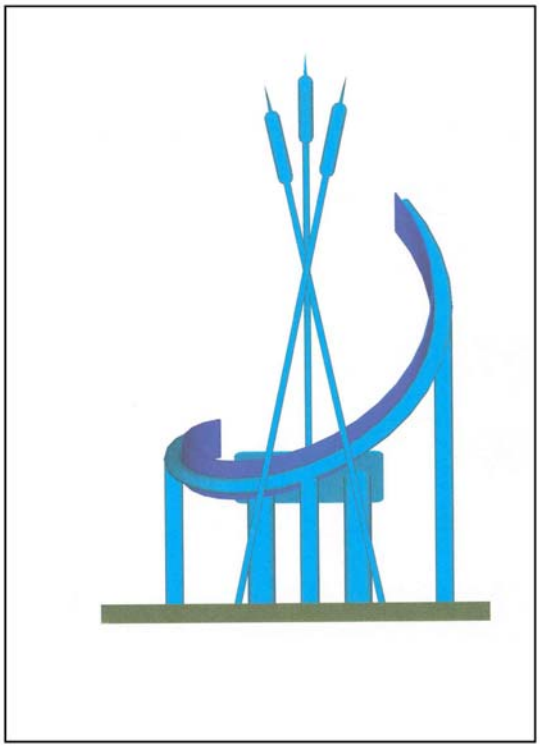
http://cadrans-solaires.scg.ulaval.ca/v08-08-04/mediatheque/gnomoniste.html

-When the layout becomes final, the distribution of paper copies and its digital version begin. My texts then start to have their own life. And I'm already thinking about another aesthetic theory and a new dial to analyze and to interpret. Let us see together how this approach works!

A brief description of the dial (**1**) (**2**):

The time band is an arc of about 270 degrees to cover the long summer days. The stretch of the band away from the ends is about 6.5 feet

The band is nearly 11 feet long by 12 inches wide. -The band is reinforced by an aluminum pipe 3 inches in diameter. (See the following 5 Figures.)



- The gnomon is represented by a long stopper nearly 15 feet and the structure amounts to 11 feet in height relative to the structure base. Two other cattails support the gnomon and give it a good rigidity. The basic structure is 22 feet. x 4 feet and is made of "angle iron" aluminum 6 inches.

- The strip was wound on a cylindrical form. It took two sections to join the band schedule and three sections of pipe but welded to strengthen the whole.

- The sundial in the *Nature Park of Pointe-aux-Outardes* (30 km west of Baie-Comeau) was inaugurated on June 11, 2008, with the latest development work. A well-known sculptor in the Manicouagan area carved four geese in aluminum which were later added to the dial.

As the motto for the dial, there was an excellent idea for the designers of the dial to select an extract of the poem *The Lake* by Alphonse de Lamartine (1790-1869), the first notable representative of French poetry in the nineteenth century:

"*Ô temps, suspends ton vol! Et vous, heures propices, Suspendez votre cours! Laissez-nous savourer les rapides délices des plus beaux de nos jours! [...] L'homme n'a point de port, le temps n'a point de rive; Il coule et nous passons...* " Le Lac (1820).

(Translated by A.Z. Foreman):

Suspend your trek, O Time! Suspend your flight, *O favoring hours, and stay! Let us pause, Savoring the quick delight That fills the dearest day[...] There is no shore of Time, no port of Man. It flows, and we go on!* The Lake (1820).

The motto sets the tone. The poem of Lamartine is an illustration of the eventful life of the political history of France in the early 19th century. The motto of the dial indicates the rather long time presence on the territory of the North Shore of the St. Lawrence River, and the traces of such a close (and almost forgotten) past of the Native Aboriginals of North America in the middle traces of plants and animals. With the help of the *Jesuit Relations* (1641-1672) (**3**), and recent research by archeologists in Baie-Comeau, we find "the time" of the first thousand people in these places that come into contact with people occupying the south shore of the St. Lawrence Estuary. "The first Aboriginal Manicouagan, described by the French colonizers in the 17th century, called *Papinachois*:" Those who love to laugh, "a trait of character still retained by their descendants ... They then migrated to the discretion of seasons between the gamey coast of St. Lawrence River during the summer months and the vast spaces inside the winter, where large herds of caribou, the king of northern forests" were circulating. Installing a dial in this eccentric territory thus takes a symbolic value: as one of the authors of archeology said: (my own translation):

"*indeed, to see things happen, you have to move yourself ... we guess that time also operated on things. This is called "*time"*, and when you play a role, it also becomes "*history"*, where it belongs to everyone to take part!"*

The symbolic analysis of the sundial of Pointe-aux-Outardes

-Some comment as simple as "this dial is beautiful" may in fact be interpreted in two ways:

1) - It refers to the idea of the archetype of a dial, the individual dial is beautiful because it is almost perfectly consistent with what should be the face of its own type of sundial. It has all the qualities required by its type. Its beauty is born from the close resemblance between the copy and the model, between the invisible archetype and the sensitive individual "ideal". This is the Greek interpretation of beauty.

2) - The judgment on beauty refers to a formal idea of beauty. It assumes that the individual dial has a *particular property* - shape, color, *etc*. – That property makes it beautiful and involves another object, such as its copy, which would have the same property and also be considered beautiful. Aesthetics will therefore seek - in vain - to define the criteria of beauty, that is to say, to set the properties that make a thing "beautiful". And, as something can be considered from the point of view of its "form", its "material" and its "end" or its destination, the aesthetics, as described by the French philosopher, Jean Lacoste (**4**), look for the idea of beauty in these objective determinations by offering four canonical concepts: harmony, usefulness, goodness, and colors:

But first, I need to examine a few examples of helical dials and some basic mathematical spirals, so as to define my subject and to better understand the aesthetic elements applied to the face of Pointe-aux Outardes.

- Some examples of helical dials

The dial of Pointe-aux-Outardes can be compared to other dials of the same type: A spiral dial by Jean Michel Ansel (France, 2000) (See Fig. 6), Bill Gottesman's Renaissance Dial Precision Sundials LLC (USA, circa 2005) (Figs. 7), Dial by Piet Hein (Denmark, 1953) (**5**) and (See Fig. 8).

Fig. 6 Ansel

Fig. 7 Gottesman

Fig. 8 Hein

L'hélicoïde droit (ou surface de vis à filet carré):
c'est la surface engendrée par une droite rencontrant à angle droit une hélice circulaire et son axe (fig.2).Son équation paramétrique dans un repère orthonormé est:

$$X=r\cos\theta, Y=r\sin\theta, Z=k\theta$$

où r et sont des paramètres arbitraires.Le point M(r,θ) de l'hélicoïde décrit une hélice quand θ varie seul et une droite parallèle à xoy et coupant Oz si r varie seul.On remarque que l'axe Oz appartient à l'hélicoïde.

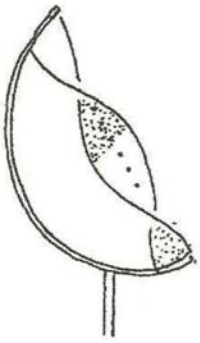


fig 1

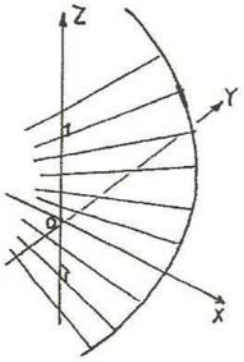


fig 2

- These four different representations of dials give me some multiple examples of forms in the nature as some simple consequences of the application of geometry in three dimensions: 1-the shell of a mollusk, the structure of DNA, the arrangement of some petals of a rose, the eye of a storm ... all sets of spirals with radiation from a center.

2 - Constructions of spirals by some mathematicians (Archimedes, Jacob Bernoulli, Fibonacci) repeat that representation, the center of the spiral is a dynamic living thing where opposites coincide, where life and death are one and the same phenomenon. A clear mathematical model of growth of the shell of a mollusk based on an equiangular spiral was given by Henry Nottidge Moseley (**6**). Extensive mid-1800s to mid-1900 studies have validated the basic model of Moseley for a wide variety of shells. The surface of the shell is a three-dimensional surface that can be seen as the result of a shift of the curve C (the generating curve is (See Fig. 9-10) usually an ellipse) along a helical-spiral H (curve structure), the width of the curve C rises to the extent that it moves along H.

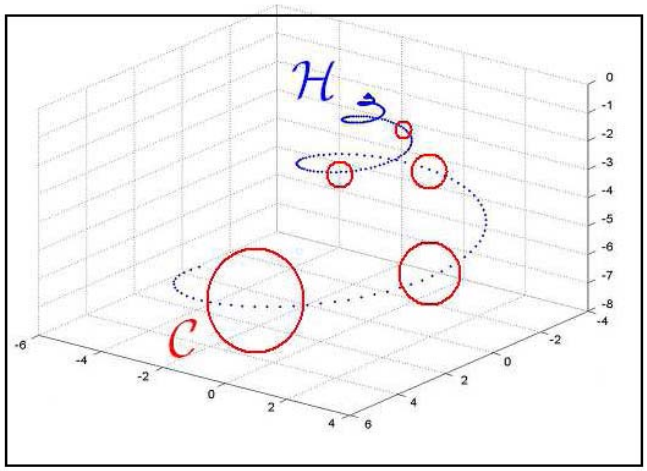


Fig. 9 Moseley 1879

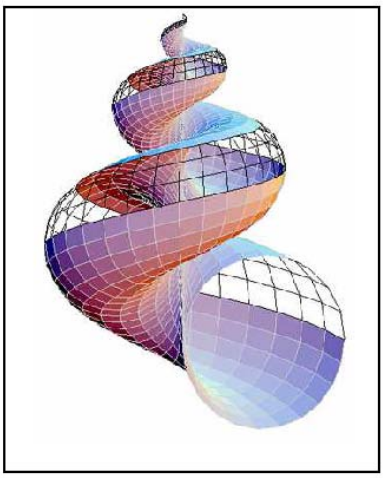


Fig. 10 Mollusk Shell

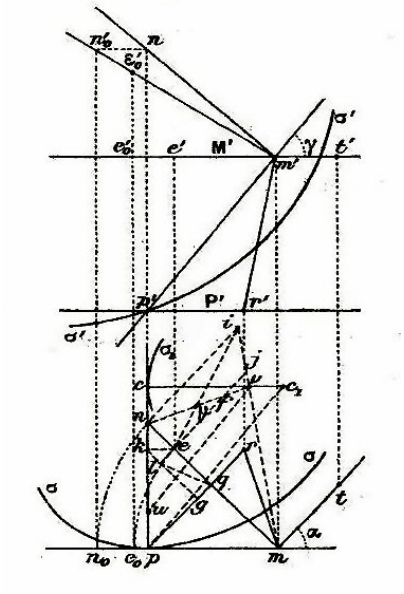


Fig. 11 D'Ocagne 1895

3 - Finally, I had access to a text written by Mr. D'Ocagne (**7**) that would have delighted the designers of the dial of Nature Park Pointe-aux-Outardes.

The idea of the mathematician is simple: taking the helicoid generated by a straight line which is a tangent to a cylinder of arbitrary cross section by meeting at a constant angle a helix is traced on the cylinder. The designers of the dial would have seen that the purpose of this article is to "deduce by geometry all elements of curvature of such a surface from those of the cross section of the cylindrical core, so as to return to simple line plots all constructions for the lines of curvature of the surface " (*op.cit*. p. 114).

This is the plane tangent lines on the cylinder. (Fig. 11). No doubt that the route of the helical shape of the dial would have been facilitated by reading this article whose formulas could be transcribed and transmitted to a computer drawing program.

-A dial put in space.

In addition to expressing time, the designers wanted to put the dial in space. We should welcome this choice because the spiral is very interesting: it becomes the alternation that provides open spaces through which the sun and the air can interfere and interact. This is one of the many surprises of the discovery of the laws of nature, in the sand and wind, in water flow and in alternating colors that distinguish the sunrise from the sunset. Also interesting, because it contains in itself all the great mysteries that are the foundation of balance and harmony, the spiral is a symbol of symmetry and balance. The mathematicians call it the *asymptotic center of the golden spiral*, as it comes to a point always approached but never reached!

The dial of Nature Park of Pointe-aux-Outardes is a good example. But in the natural world, from the infinitely large to the extremely small, the movement of people and things proceed from certain principles of dynamic equilibrium and spontaneous tendency to seek stability.

What amateurs would discover in this park is nothing less than an example of mysterious forces that construct the world in which we live. The beauty also comes from the power that acquires the ability to translate complex equations in the phenomena found there.

Of course the beauty of the dial is not perfect, given the problems to stretch the dial plate. Let us retain only that it shows a very human tendency: the search for a perfect harmony between balance and movement, between the familiar and the unknown in our quest for knowledge, between what we are and what we are capable of being ....

Conclusion

The beauty of the dial does not rely on any artifice, but rather is the result of hard work and specific concepts shaped by human hands.

Without having the same burning brilliance of other mythical places (the Waipoua Kauri Forest in New Zealand, the Sydney Opera House in Australia, the Bygdøy peninsula in Oslo, the highlands of Machu Pichu in Peru...), the Nature Park of Pointe-aux-Outardes gives a note of gravity to the dial installed in this natural setting. If the park and landscaped mixed an almost perfectly balance between the sea and fresh water, it adds a painful fate by creating a "hesitation time" for the visitor. A time for meditation!

The park seems a beauty reflecting an image of the absolute, to which nothing can be added! And yet ... everything inspires a fragile, limited and ephemeral world! Finally the dial has integrated a structure of a spiral that carries some long and symbolic meanings. In the embryo galaxies, nature sends us one of the most dynamic messages, the reconciliation of opposites and yet harmonious and asymmetrical. In short, it is a beautiful dial!

Notes:

1) Yves Melançon, Le cadran solaire du Parc Nature de Pointe-aux-Outardes, *Le Gnonomiste*, Volume XIV numéro 4, décembre 2007, p. 8-9.

2) Yves Melançon, Inauguration du cadran solaire, sur la Côte-Nord (11 juin 2008), *Le Gnonomiste*, Volume XV numéro 3, septembre 2008, p. 14.

3) *The Jesuit Relations and Allied Documents*, originally compiled and edited by Reuben Gold Thwaites and published by The Burrows Brothers Company, Cleveland, throughout the latter part of the nineteenth century. Each file represents the total English contents of a single published volume. The original work has facing pages in the original French, Latin or Italian, depending on the author. (In French): *Relations des Jésuites* (1666-1672), Tomes 1-6, Éditions du Jour, Montréal, 1972.

4) Jean Lacoste, *Les aventures de l'esthétique. Qu'est-ce que le beau?* Paris, Bordas (coll. "Philosophie présente" 2003, 272 pages.

5) Piet Hein's dial was installed at Egeskov in Denmark. It is covered by the American patent (United States Patent number 5.181.324 from 26.01.1953) regulating the use of the right helicoid with its formula and parametric equation. To understand this Danish dial, I invite the reader to reread the interesting article by Bernard Rouxel, in *Le Gnomoniste*, Volume XVII numéro 2, juin 2010, p. 20-23. Bernard Rouxel's original text can be found in Cadran Info, Mai 2006 No 13, page 70-71.

6) H.N. Moseley, Notes by a Naturalist on the "Challenger" (1872-1876), London, Macmillan and Co, 1879.

7) M. D'Ocagne, Étude géométrique sur l'hélicoïde réglé le plus général, Bulletin de S.M.F. tome 23, (1895), p. 114-121 (http://www.numdam.org/).

André E. Bouchard *600009@sympatico.ca*

Pointe-aux-Outardes, Québec, (2008)

49°03’09’’ North 68°23’39’’ West