

that CO₂ is one of the so-called greenhouse gasses which act to hold in Earth heat. Climate models suggest that a doubling of CO₂ will warm the planet by about 2.5 degrees Celsius. When the greenhouse impacts of methane and nitrous oxides are added to that of CO₂, the warming at that time may reach as much as 4 degrees.

So what does this have to do with the Conveyor? Two things, both of which will tend to decrease the density of waters in the polar regions (and therefore in the northern Atlantic). First, the polar regions will gradually warm. Second, as the planet warms, more water will evaporate from the oceans and consequently more rain will fall. At high latitudes where precipitation exceeds evaporation, this increase will dilute the salt content of surface waters. Hence the greenhouse buildup will produce a double whammy! Climate models which simulate the response of the ocean as well as of the atmosphere suggest that once the global warming reaches 4 degrees Celsius that there is a distinct likelihood that the Conveyor will shutdown.

Let's say that our man-made greenhouse warming push in a century or so pushes conditions in the northern Atlantic over the brink. What would a world without the Conveyor be like? If we adopt what happened when the Conveyor shut down at the onset of the Younger Dryas as an analogy, then the region around the northern Atlantic would cool dramatically. Further global rainfall patterns would undergo a dramatic shift just as happened during this year's El Niño. Storminess would likely increase. But, fortunately, conditions on Earth would not deteriorate to the extent they did during the Younger Dryas. The reason is that at the time of a greenhouse induced shutdown, the Earth would be several degrees warmer than now. Rather more likely, while temperatures downwind from the northern Atlantic would drop below today's, in the rest of the world the cooling would merely offset part of the accrued greenhouse warming.

So, one might conclude that such an event would not be so awesome after all. After the reorganization was complete, after some accommodation to the new conditions, life would go on much as before. Perhaps, but the transition period would likely be a very unpleasant one. By analogy to any of the reorganizations recorded in Greenland ice, during the transition period climate would undergo large flickers. These flickers would continue for several decades before climate finally settled down into its new mode of operation and would be fast enough and frequent enough to make a shambles of agricultural planning. With a projected 9 to 10 billion people to be fed from lands which now stretch to feed only 60 percent this number, these flickers could be disastrous. As their course would be unpredictable, crop failures due to swings in rainfall patterns could well lead to massive starvation.

Our captains of industry don't want to believe even that CO₂ will significantly warm the Earth. They certainly don't want to listen to Chicken Little's cry that the Conveyor might stop. They justify their reluctance by quoting the one reputable atmospheric dynamist who pooh-poohs greenhouse warming. MIT's Richard Lindzen feels strongly that the increase in atmospheric water vapor central to the warming predictions will not occur. If he is correct, then indeed there is no problem. But stacked against Lindzen's scientific intuition are the results of all climate models. The other 100 or so reputable atmospheric dynamists take these model results seriously and are concerned

that the water vapor feedback will boost CO₂'s impact several fold. Of course, until the Earth's response (or non-response) to rising CO₂ sends a clear message as to whether the model simulations or Lindzen's intuition is correct, the debate will continue. During the 20 or so years which will pass before a conclusive observational result is in, it would be prudent for us to diligently prepare to meet a possible need to greatly reduce CO₂ emissions during the second half of the 21st century. Past climate records kept in ice and ocean sediments sends us the strong message that the Earth's climate system is an angry beast. We are poking this beast. Beware!



WHIRLPOOLS

MARIO SATZ

The force of the earth's rotation on objects is known as the Coriolis Effect. This effect follows the model of Ferrel's Law, which holds that all moving bodies tend to veer toward the right in the Northern Hemisphere and toward the left in the Southern Hemisphere. For example, it is why an observer may be surprised to find that water drains in one direction in Australia and in the other direction in Europe (although the observer himself is subject to the double helix of his genetic code). Because of the Coriolis Effect, biological asymmetry loosens the geometric exclusivity of circular forms, opening them into heliocoids; this is the model for osseous, corneal and calcium growth, found in a kneecap, a ram's hollow horn or a gastropod's shell. Spirals are driven by a dancing force, either ascending or descending, whose emotional transcription lies between vertigo and ecstasy: in their presence we feel vaguely drawn in or absorbed. The sensation is irresistible and complex, yet it obeys a rule as simple as that of the whirling dervishes of Konya.

The spiral is to geometry what the whirlpool is to water. In air or in a vacuum — a column of smoke or a galaxy — ethereal matter displays an evanescent discontinuity which transports us from a minimum to a maximum via the opening up of our senses. The same pattern or model occurs beneath water's transparent and homogenous silk, as if the liquid were acquiring a form based on a vibrating conical irregularity, and as if there were something orgasmic and genetic about the centrifugal force caused by the whirlpool. In Spanish, to drain oneself is also a good way of referring to the climax of the love act. Simply stated, a spiral is a curve that begins at a point of origin, from which its curvature continuously diminishes [1]. It is a curve whose concave radius increases constantly, and (as in erotic experiences) as its power grows its motives are revealed, like echoes of a voice that had only moaned. The spiral, like the whirlpool, is a line that travels, the most nomadic and ambiguous of all forms.

T. A. Cook [2] studied ruminants' horns and mollusk shells — those drawings and arrangements that according to

Pliny offer the conclusive proof the Nature's playfulness, *magda ludentis Naturae varietas* — and arrived at the conclusion that mathematical constants act as limits on the passion to proliferate. In the curl of a lock of hair, in a strand of wool, in an elephant's tusk, in the tendrils of a grapevine, in a shoot of jasmine, *the curved part of a spiral is a frustrated attempt at returning, the geometric compensation to love's daring arithmetic* which, as the supreme energy of the universe, seeks continuous multiplication beyond itself, trying to fulfill the inexorable laws of growth and abundance. In whirlpools this insistence is often caused by the wind, the supreme inseminator. When the wind blows a powerful gust across a river or a waterfall's pool, or even when it hurls itself angrily into the middle of the ocean, the waters open and begin to flee unpredictably, giving new life to the waves and foam. The snail shell *Nautilus pompilius* (which gave the North American engineer Lester Allen the model for his hydraulic turbine) is the perfect paradigm of whirlpools' spiraling tendency, which one way or another eventually form the shell of dreams. At the same time, the mollusk shell's pearly surface is reminiscent of the Metonic shifts of the moon, i.e. its recurring cycles. The Babylonians, who raised brick whirlpools in the ziggurat construction of their observation towers, were clearly the first to discover the so-called Metonic cycle, according to which the moon passes through the exact same places every 19 years. And what is there between 1 and 9, the number that Dante considered not only heavenly but also the fundamental mark of development from a unit that, upon reaching its maximum form, returns to itself on a different plane? If we add the two numbers together we return yet again to the Pythagorean theory of ten, in which the 1 is masculine and the 0 is feminine, metaphors of fullness and emptiness that are conjugated by both the whirlpool and its calcified offspring, the Nautilus.

Perhaps we might imagine the beginnings of life as the tracing of a logarithmic or equiangular spiral that in some part of the vast universe, in the mind of the cosmic night, determined its profound identity. Situated among the grandest of the celestial spectacles, the spiral galaxies [among which our own Milky Way is an outstanding example) contain stars that are very young [3] — between 10 and 25 million years, i.e. between a quarter and a half of one percent of the age of the sun and the earth. Because of this morphology, astronomers frequently search for evidence of continuing birth of stars in spiral structures. As their appearance suggests, these features were caused by the phenomena of collision and gaseous compression. It is as if we were throwing dice that bore geometric symbols on their sides, and when they came to rest we always encountered the omphalocentric symbol of the spiral on the side that produces the creative revelation, the *fiat lux*. The most widely accepted explanation of the production and maintenance of large-scale spiral structures is the density wave theory developed by C. Lin at MIT in the United States; according to this theory, within galaxies of this kind there is a wave of gravitational potential that takes the form of a broken helicoid, moving like a boomerang in the central galactic plane. As a result, when the density wave passes through outer space, dense concentrations of dust and gas are created and are later discernable as spiral branches.

Our own galaxy consists of three basic parts: the nuclear region, which extends from our sun over a distance of 5,000

parsecs (a parsec is equal to 3.26 light years): the narrow disk around the sun, no more than 500 parsecs wide, which contains the most spectacular elements of Population I and in which the spiral structure is predominant; and the outer halo, which is fundamentally inhabited by Population II. The spiral region expands outward from the sun across the galactic plane from about 5,000 parsecs to about 15,000 parsecs and is located more or less in the center of this array of stars. The astronomer who studies spiral galaxies detects that *the curves and luminous branches are quite visible there, the material is less dense, and dust, particles and gas expand outward toward the edges what the center (which is the true cosmic embryo) holds coiled within its core*. From this pattern or norm, we might infer that youth belongs to the periphery and adulthood to the nucleus; or put another way, the greater the density, the greater the peace and stability. What is clear is that nothing is peaceful in the cosmos. In measurable time the perimeter of a wheel spins faster than its axis: the same thing happens in those vast hurricanes and tornadoes, which are equally if not more dangerous in their outer limits than in the eye itself.

Central American pre-Columbian mythology deified the hurricane that so often laid waste to the fragrant coasts. The very word hurricane is Caribbean in origin; scientifically, it refers to a tropical cyclone with winds of 73 miles per hour or more, accompanied by thunder and lightning. Cyclones (from the Greek word *kýkloma*, which means wheel and also the turn of a winding serpent) are usually defined as storms or wind systems that rotate around a center of low atmospheric pressure; in the Southern hemisphere they rotate clockwise, in the Northern hemisphere counterclockwise [4], which brings us back to the Coriolis Effect. Together, the hurricane and the cyclone gestated over a period of centuries the terrifying god that some linguists believe was the origin of the strange image of a one-legged god: *ju* or *hu*, meaning one; *r*, meaning its; and *akan*, meaning leg. According to legend, Huracán or C'ux Caj (Heart of the Heavens), was united with C'ux Ulew (Heart of the Earth); after this encounter, when the earth formed one of its legs, it remained on solid ground as a memento of this godly love, just as the great whirlwind that sometimes sweeps furiously from the sea is the other part, searching for its partner.

In the Quechua language [5], the Hurricane is the greatest deity of the pantheon. It is a creature made of water and fire, of life and energy, the very axis of the universe; in the pre-Columbian mentality, the meteorological hurricane seems to contain the eye of the universe, and the human eye gave birth (sometimes violently) to the most profound visions that the American world had with regard to our species. From the earliest times the priests and shamans observed the hurricane's behavior; when the violent storm that stopped the hurricane was unleashed, half the diameter of the hurricane had passed and the center had been reached. After passing through this *empty space*, it shifted immediately into the second half. From this [6], the unexpected interval of tranquility followed immediately by renewed aggression was experienced as a mystic lapse of extraordinary importance, similar to an island of beatitude between two epileptic attacks. The serene comprehension of the order of the universe between the very wings of its catastrophes.

The wise gaze of the astronomers also detected the fact that the Hurricane was the horizontal transcription of what they

saw in the vertical and celestial plane as *a rotation of the Ursa Major and the Ursa Minor around the pole star*. As Fernando Ortíz wrote [7], “They saw all the celestial luminaries as rotating around a single point or axis; and each year, following that same line of imposing force, the furious Hurricane descended in order to be released.”. The meteorological phenomenon descended in order to test the rectitude and constancy of mankind, who had to be tested periodically. Like a moving judge, a great tornado would occasionally sweep through with words of lightning and phrases of thunder. Ortiz cites a passage of the *Rig Veda* in which Rudra, the god of storms who rides a whirlwind and whose team of horses is harnessed in the form of a caracole, creates the first whirlpools as part of the beginning of world; and from them *embryos are created*. As MacKenzie notes [8], “The first whirlwind was the cause of the first whirlpool.” In Hebrew *maarbolet*, or whirlpool, comes from two key roots: *maar*, which means nakedness or void; and *bal* or *bilti*, which means without, lacking. Here the reference to the eye of whirlpools and hurricanes is clear, as is the negation of all stability, which is also implied in genetic or fluctuating moments. It is quite possible that the “breath of God” that blew across the waters (Genesis 1:3) might have created life by means of this miraculously twisted form.

In the *Diccionario del uso del español*, María Moliner (like Covarrubias before her) recalled that the mark of the whirlpool also presides over the crown of the head where hair growth commences. Michio Kushi, who was one of the founders of macrobiotics, held that the spiral form (which in water becomes a whirlpool) governs our nutritional process; cooking changes products from the vegetable realm via the pre-atomic realm and via the vibrations that contract or expand (depending on the moment) in concentric waves, converting matter into energy. Thus peristalsis, the worm-like movement characteristic of tubular muscular organs (such as the intestines, through which lumps of food are drawn) acts according to the same dynamic as that which the whirlpool exerts on water and the spirals on the nuclear galaxies. This may be why, in the pre-Columbian world, the Hurricane was considered the principal cause of psychic and biological catharsis, inspiring poets and taming animals.

Early geometers and mathematicians also noted the sign of the equiangular spiral in the movement of whirlpools; it is a sign in which rationality and irrationality go hand in hand. The first to study this was Descartes in the 17th century, followed by Torricelli; later, at the end of the 17th century, John Bernouilli proved many of its most important properties. He was so struck by what he discovered that he had his tombstone inscribed with the epitaph *Eadem mutata resurgo*, which might be translated as ‘although changed, he remained unchanged.’ This is the definition of the equiangular spiral — the geometric point P that moves on a plane in such a way that the tangent P forms a fixed angle with an outward radius and the vector OP, where the point O is fixed — is an analogy to the psychological configurations that are detected in times of crisis, like cracks or openings toward a new precipice of age. In summary: *we change but we remain ourselves*. We possess a regularity, a predictable unfolding; however, to be precise, this regularity develops irregularly. Some shells and fossils have forms quite similar to that of the equiangular spiral, and our lives seem to follow the same pattern in both our advances as well as our relapses. We

unconsciously employ phrases such as “so-and-so is fossilized” or “so-and-so is a little tornado” in reference to a fixed character or to a quantum leap in an adolescent’s development.

There are many plants that in their “inflorescence” reproduce forms analogous to the equiangular spiral. They begin with a primary shoot, from which springs a second at a definite angle; another shoot follows on the same side and at the same angle, and so on continuously. Thus the deflection or curvature is continuous and progressive. It is not caused by any external force, but rather is due exclusively to factors inherent in its system of biological organization. To the naked eye the angles of the successive shoots are all equal, and the length of the shoots diminishes in a constant rate. The final result is that the successive shoots or successive increments of growth are the tangents of a curve, and this curve is a true logarithmic spiral. There is a pre-Columbian proverb that seems to reflect the long whirlpool of pleasure and pain that constitute a life: *choquiztli moteca, ixayotl pixahui*. It means ‘the cry spreads out, the tears fall like rain’ [8]. Individual destiny consists of a more-or-less discernible current; when seen in its entirety, this diffuse and irreversible current gives way to scattered whirlpool zones, ‘where tears fall like rain’, zones of suction, traction, bursts of centrifugal force that seem to indicate a change of direction when in fact they are nothing but an accentuation of the direction already taken. Even the umbilical cord, that part of the body evident only in the naval, shows the signs of the whirlpool. In its gelatinous material, nearly a meter in length, resides the umbilical vein that carries oxygenized blood to the body of the foetus, and two umbilical arteries that carry the used blood to the placenta. Thus the liquids seem to impose the model of their rise and fall, their flow and return.

If we were able to draw an adjusted map of the migration of eels (*Anguilla anguilla*), we would immediately discover the drawing of their living whirlpool in the Sargasso Sea, which is mistakenly thought to encompass an immobile zone. Situated to the south of the Bermudas and to the west of the Atlantic Ocean, the Sargasso Sea is the focal point of a vast rotating current of the North Atlantic. On the surface it is a peaceful region of water, but there is turbulence in its depths. There, in the dense egg-laying area — the equivalent of the eye of the hurricane — the metamorphosis of the leptocephalus into eel begins. And this is also probably the place of origin of the pre-Columbian fantasy of Quetzalcóatl, “the beautifully feathered serpent”, the walking god who was the symbol of religion, art and writing itself. Like the tornadoes and cyclones that gestate in the heart of the oceans, it involves the death and resurrection of natural beings. Whether because the eels creep, jump and twist during their migrations, or whether because in certain species *the bite produces a lightning-like effect* (and for this reason these creatures were feared and closely observed), or whether because the great snake, the whirlwind and the whirlpool all coil around themselves, what is clear is that the Hurricane and Quetzalcóatl are related.

Mother-Father, Quetzalcóatl also proceeds from the coupling of the ocean and the fury of the heavens; in other words, like all of us, from the erotic embrace in which a spermatocidal spark navigates head first toward its goal of fertilizing the egg. According to Cárcamo [9], “the feathered serpent of the Maya and Aztec civilizations appears to be related

fundamentally to the child's anal-digital preoccupations. It is a bisexualized symbol of fertility that arises as a hypertrophy or overstatement of the life instinct in opposition to the death instinct." When the hurricane and its whirlwind and destruction sweep over man-made structures in a fury of water and mud and rain, what remains takes on an aspect of waste or residue or excrement: trees torn out by their roots, trails of vegetables, cadavers, utensils, broken pottery, driftwood, rubbish and broken exteriors. It is not unlike when the maternal contractions and the breaking of the water (we are born *inter faeces*) expel the life of one individual after another. Thus from these spiral fugues of water, from these astral whirlwinds, from these spinning galaxies, one must look for the greatest of things after the catastrophes of their agitations and discharges.

In the equilibrium of its line, the circle defines and encompasses the divine; but the spiral, which is an open or broken circle, is the indefiniteness of the human, the sign of its continuing and never-ending future. Most dances mix the two, the circle and the spiral, but only one dance has taken it to perfection: the *sema* or reunion of whirling dervishes and sufis, which is thought to be a reflection of the Pythagoric conception of the rotating music of the spheres and their mother-plasmas, the galaxies. The dancing order was founded in the 13th century by Mevlana Jalalu'ddin, a poet and mystic, who emphasized the movement of the subject and the music over written or spoken language. One can still witness the measured, careful steps of the dancers, with one hand toward the sky and the other toward the earth (like Buddha after his enlightenment!), surrendering to the intoxication of the music played on a reed flute and a small drum. The enthusiastic participants of the *sema* come from various villages in Asia Minor, where the tradition of dervishes seems to be rooted. They are approached with a peculiar anxiety, known for centuries:

When you are everywhere, you are nowhere

When you are somewhere, you are everywhere

The cryptic syllables of these lines (which are attributed to the sheik Necmeddin [10]) reflect the essence of the Sufi creed with respect to divine omniscience. The coherence of wonders, the certainty that what has no end has no beginning, are already present here, subtle within the implicit order. It is we who must "screw ourselves" (as the dance encourages) into the Unique, the Sun of Suns. Memory, the *zkhir*, is agitated by repeating His Name, releasing the serpentine secrets: it is untied in a sequence that goes from molecules to atoms, from atoms to elemental particles. An agitated whirlpool saves us from the abyss of forgetting. Thus the cosmic genealogy opens like a Nautilus snail between the veils of the heart. In the eye of the dance's geometric hurricane, in its hollow axis, the *fana'* or annihilation of the ego is complete. The whole universe, which was lying hidden beneath the drowsy folds of our eyelids, now awakes in the corkscrew of itself. The flute ceases, the drum falls silent. A galaxy is being born. Understanding has arrived, silent and unequivocal.

NOTES

- [1] Thompson, D'Arcy: *Sobre el crecimiento y la forma*. Blume, Barcelona, 1930.
 [2] Cook, T. A.: *Spirals in Nature and Art*. London, 1903.
 [3] Brandt, John and Maran, Stephan: *Lo nuevo en astronomía*. C.G.E., Mexico, 1977.

- [4] Ortíz, Fernando: *El huracán*. Fondo de Cultura, Mexico, 1984.
 [5] Yólotl G. Torres: *El culto a los astros entre los mexicas*. Diana, Mexico, 1979.
 [6] Tannerhill, Ivan T.: *Hurricanes, their Nature and History*. Princeton, 1944.
 [7] *El Huracán*, op. cit.
 [8] Soustelle, Jacques: *La vida cotidiana de los aztecas*. Fondo de Cultura, Mexico, 1984.
 [9] Cárcamo, Ernesto: *La serpiente emplumada*. Revista de Psicoanálisis, No. 1, Buenos Aires, 1943.
 [10] Friedlander, Ira: *The Whirling Dervishes*. Wildwood House, London, 1975.



VIRGINIA WOOLF, TIDES OF FADING IDENTITIES

JUANI GUERRA

She stood there watching the clouds floating by and the leaves trembling; in the midst of chaos, things were taking shape; sometimes its unceasing coming and going and waves flow into stability.

(V. Woolf. *To the Lighthouse*)

Delving into the plastic dynamics of *Jacob's Room* and then moving on *To The Lighthouse* is opening up ones insight to the human transformation encompassed within the erratic movement of *The Waves*. And it's that Virginia Woolf's literature, her poetic narrative, progresses from the scattering or fading of human feelings among the crashing of the waves, among the surprising rhythms of the foam: The sea is the conscience at all its levels — logical, illogical, topological, its outgoing tides but also its incoming tides, its overflowing, its lights and its shadows. The sea is the myriad impressions which inhabit our re-forming perception of reality by enchanting it. The sea is the local thought which wanders hither and yon through the nooks and crannies of uncertainty: Liquid folds now ever-changing among which the essential visions randomly come to fore. Virginia was captivated by the infinite possibilities of the sea as a literary metaphor or as an analogy of the infinite possibilities of life itself, the origin of the most profound of visions of human identity. It was in that great metaphor that Virginia's novel writing drifted in a sort of prodigious structuring from her first works such as *Night and Day* (1919) or *The Voyage Out* (1915) up to her crossing the threshold of purely vagabond abstraction in *The Waves* (1931). Paradoxically and in a final act of loyalty to her realm professional pursuit, Virginia, the author, experienced the final heartrending symbiosis of losing her own life at the water's hands. These are some of the creative forces of a text which toys with ambiguity by shouting out at the reader: "Nothing!".

I love swimming. And it almost always awakens my senses.

What is Raquel doing with her gaze fixed on the green depths of the sea? She's sensing, diving her freedom or her final trip "under the glassy, cool, translucent wave". I have opened and shut *The Voyage Out*. It's too cold right now, I'll come back some other day.