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USE OF CHRONOLITHOTHERAPY FOR BETTER INDIVIDUAL HEALTHCARE AND WELFARE

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Abstract

Knowing Man's innate clocks functioning allows to understand WHEN and WHY therapies are efficient. Vigil chronotypes determination and respect allows to avoid scholars' failure. Performances depend on chronotypes and time changes. Both minimal and maximal durations of night sleep cycles result from interactions between endogenous and exogenous clocks. Our ecoexotope is structured by solar, lunar and terrestrial rhythms which are synchronisers for endophysiotope clocks. Man night sleep changes depend on lunar cycles entrainment. Sleep analyses point to circa-annual solar rhythms used as controls to evidence circa-monthly lunar ones. To evidence physiological responses individual longitudinal records are used. To evidence lithotherapeutic effects, stimuli responses are tested according to a double-blind placebo-controlled survey. WHAT mineral to chose?, WHY?, HOW to treat?, WHEN? Compared with controls, jadeite or nephrite enhances night sleep quality with a 15 fold decrease of awakenings and urinations. The highest placebo effect was below 4 fold increase. Depending on minerals and trace elements, properties change. The mineral crystal structure is evidenced to have an action. The contact area with the skin is a limiting factor. Placebo effects are greater during the day phase. Red jasper treatment enhances the number and intensity of diurnal physical working. Minerals act in a dose-dependent manner and in synergy. Hematite sole gives a placebo effect, but increases the effect of serpentinite by a 15 fold value. Within a clocks network, the latency phase of the whole is shorter than the shortest latency phase of each clock, enhancing the system reactivity.

Keywords: Chronobiology, dose-dependent effect, double-blind placebo-controlled trials, ecoexotope, endophysiotope, latency, lithotherapy, unexpected emergence

1. Introduction

Our modern human society is using drugs everyday, everywhere and for everything: -antibiotics to fight against bacterial diseases or to add to animal food, -hormones to enhance animal growth or to avoid man reproduction, -phenols as chemical compounds in plastic bottles or disinfectants, -systemic insecticides... "Drugs use and abuse makes money." But sooner or later all these man-made chemicals

accumulate in soils and waters. Systematic use of chemicals is creating systemic problems for man survival: -emergence of antibiotics resistant bacteria, -toxic water for drinking or cooking, -feminisation of male fishes... WHY? Our "Take-Make-Waste" society is not sustainable and is less and less sustained by people. A "Take-Make-Waste but Recycle" society is intended to cure these systemic problems (http://armsada.eu). Recycling makes money too... And it works (Doolotkeldieva et al. 2015)! But prevention is better than curing! Systemic solutions exist for prevention of such systemic problems: -chronobiology for a better healthcare and -lithotherapy for a better welfare. HOW? WHY? Chronobiology allows to use -only when necessary- just the right amount of drug, at the right time (Lévy et al. 2008) and the right place. But we must first know the temporal organisation of the living systems we are acting on (Bricage 1985, 2015). The question is: WHEN? Lithotherapy uses minerals for their natural potential applied to physiological processes. The questions are: WHAT? WHAT FOR? HOW?

2. The Temporal Organisation of Living Systems

The time graphed simultaneous variations in man glycaemia, glucagonaemia and insulinaemia can be explained as a cybernetic process: the global control of blood glucose concentration depends on ago-antagonistic retro-controls (Figure 1).

2.1 Example of Temporal Organisation: the Human Glycaemia Hour Touring, an Endogenous Clock

We can graph the same recorded values as a systemic process, using time independent instant simultaneous interactions between glucose, insulin and glucagon concentrations. We can also graph the instant interaction between glucagon and insulin -whatever the time and glucose concentrations- and we will have the real time arrow of the living system internal clock (Figure 1).

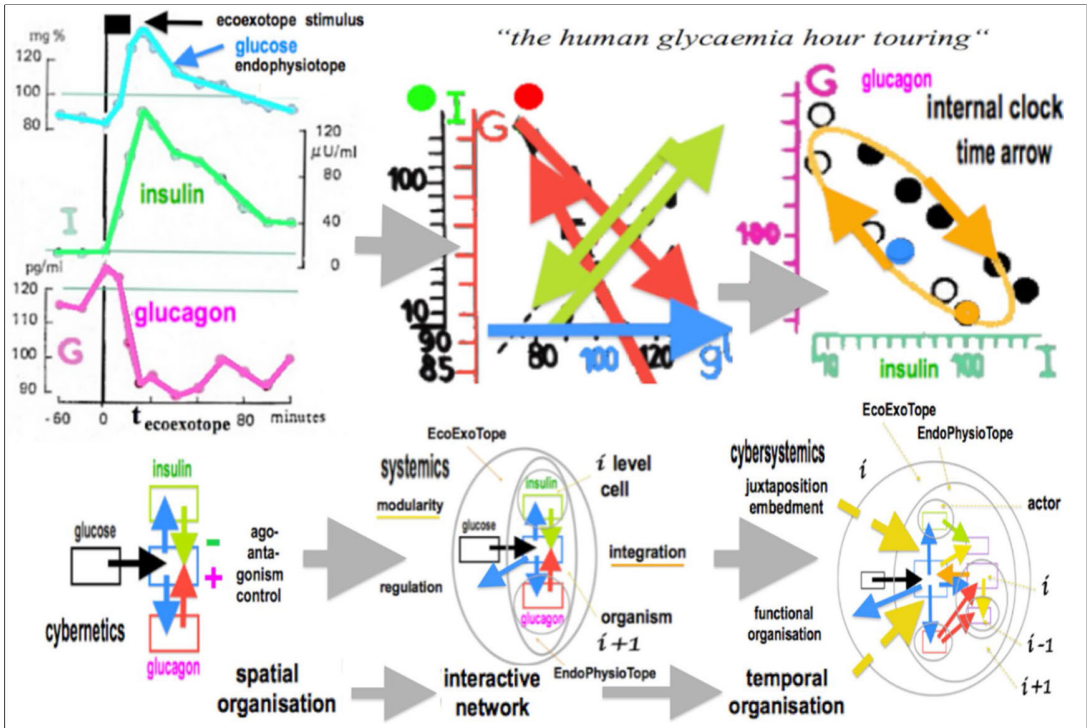
Pointing to the juxtaposed and embedded levels of organisation, using a cyber-systemic approach, we can graph their instant local and global interaction network to evidence an innate inheritable clock. Simultaneously pointing to spatial organisation, networks of interactions and temporal organisation, the clock is an innate and inheritable specific component that cannot be changed. Knowing the endogenous clock allows to understand WHEN and WHY paradoxical therapeutic strategies are efficient while logical ones are not (Bricage 2004).

For diabetes treatments, now we know it is neither enough to know the place (WHERE), the mechanism (WHAT FOR) (Müller et al. 1970), and the functioning (HOW) (Ren et al. 2015), nor the determinism (WHY) (Nagorny and Lyssenko 2012), what we need to know is the time: WHEN (Bricage 2013)!

2.2 Vigil Chronotypes Determination and Respect: the Best Way to Avoid Scholars' Failure

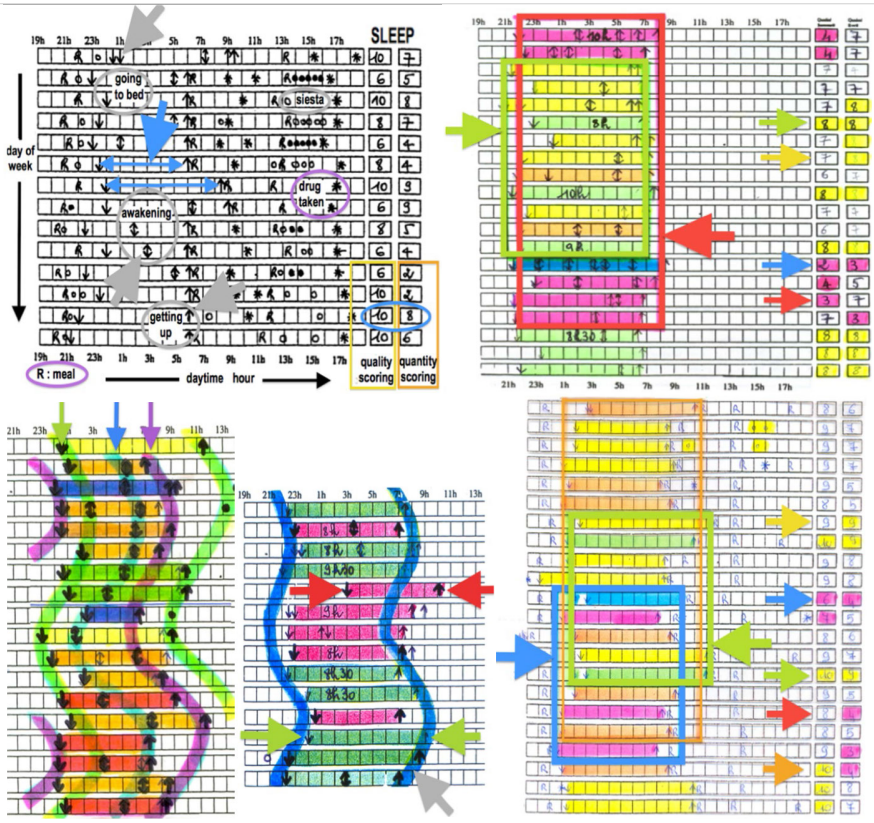
Using sleeping schedules (Figure 2), with day to day scoring of sleep quantity and quality, everybody can determine her/his unique vigil phenotype based on its "going to bed, getting up and night awakenings" pattern. Three types stand out: a morning type (people who go to bed early and get up early), an evening type (people

who go to bed lately and get up lately) and a rhythmic chronotype (people who are neither morning type nor evening one but both, depending on the day).



- top left : glucagon and insulin concentrations timed changes depend on glycaemia timed changes,
- bottom left : reciprocally, glycaemia changes (blue box) are controlled by glucagon and insulin changes.
- top medium : time independent relationship Y=F(X), between glycaemia changes X= **gl** (blue arrow) as a cause and insulinaemia (**I**) and glucagonaemia (**G**) changes, Y= **I** or **G**, as effects; same as insulinaemia and glucagonaemia related changes as causes, **x**= **I** or **G**, and glycaemia changes **y**= **gl** as an effect y=f(x).
- bottom medium : internal glucose changes depend simultaneously on ***ecoexotope*** (*exo*: external, *tope*: space-time, *eco*: of inhabitation) inputs and outputs (Bricage 2002a) and on ***endophysiotope*** (*endo*: internal, *tope*: space-time, *physio*: of functioning) changes (Bricage 2002b, 2004, 2013, 2014) -Creative Commons free ShareAlike licence-.
- top right : glucagonaemia and insulinaemia interactions, **I**=f(**G**) or **G**=F(**I**), govern the endophysiotope clock shape and time arrow, here represented as an ecoexotope independent innate endophysiotope clock.
- bottom right : when taking into account the organisation levels (Bricage 2001b), the organism temporal organisation (**grey arrows**) emerges from the interactive functional percolating network (Bricage 2005) of all ecoexotope and endophysiotope embedded and juxtaposed actors (Bricage 2001a, 2002b) -Creative Commons free ShareAlike licence-.

Figure 1 From cybernetic processes to systemic and cyber-systemic ones



- sleep agenda (top left): longitudinal record (1 month duration, each day recording, with daytime hour), with each day quality and quantity of sleep scoring (**yellow rectangles**), the events of day and night phases (going to bed, getting up, sleep awakenings: **grey arrows**, taking food or drug: **violet circles**) and with each sleep duration (**blue arrow**) associated with global scoring (**blue circle**) (Bricage 1993, 1998a) -Creative Commons free ShareAlike licence-.

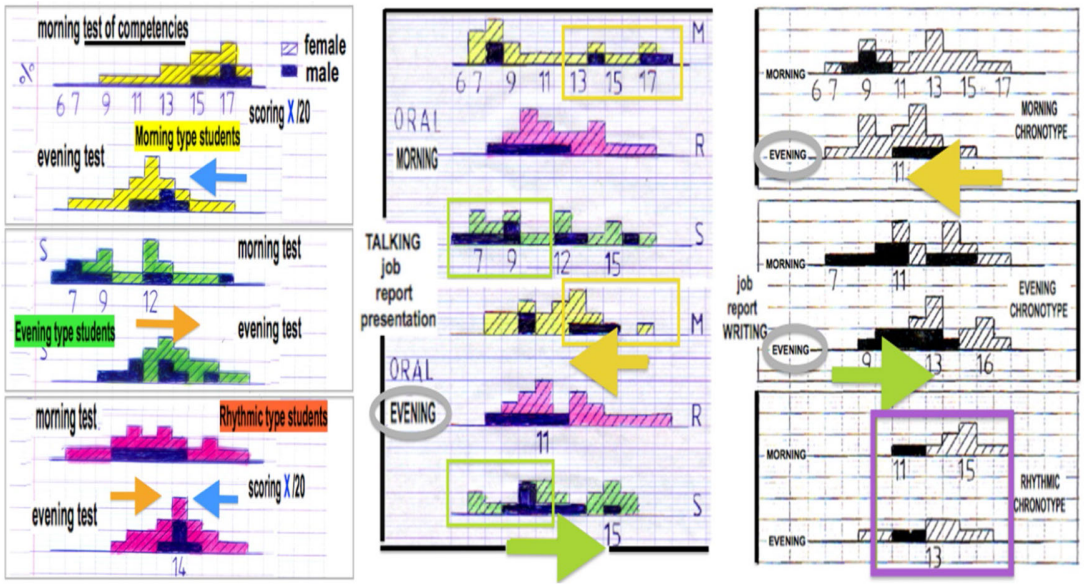
- ***morning type*** (top right): good scoring (better nights indicated in **yellow**, and the best one -**small green arrow**- in **green**) if going to bed early (**big green arrow**) and getting up early (**left shifted green rectangle**); bad scoring (bad nights indicated in **red**, and the worst one -**small blue arrow**- in **blue**) if going to bed lately (**right shifted red rectangle**) and getting up lately (**big red arrow**) (Bricage 1993, 1998a) -Creative Commons free ShareAlike licence-.

- ***evening type*** (bottom right): good scoring (better nights indicated in **yellow**, and the best one -**small green arrow**- in **green**) if going to bed lately (**right shifted green rectangle**) and getting up lately (**big green arrow**); bad scoring (bad nights indicated in **red**, and the worst one -**small blue arrow**- in **blue**) if going to bed early (**big blue arrow**) and getting up early (**left shifted blue rectangle**) (Bricage 1993, 1998a) -Creative Commons free ShareAlike licence-.

- ***rhythmic type*** (bottom, left and middle): -on the left- whatever the night sleep quality, all awakenings are aligned on parallel sinusoids (**violet**, and **green** curves) of the same period, ***all events aligned along parallel sinusoids*** -on the middle- good scoring (better nights indicated in **green**) if both going to bed and getting up at the hours of the sinusoid (**green arrows** on the **blue sinusoids**); bad scoring (bad nights indicated in **red**) if going to bed or getting up not at the sinusoid hour (**red arrows** outside the **blue sinusoids**): good if *"on time"* (**grey arrow**), bad if *"lagged"*.

((Bricage 2006) Agenda du sommeil & types vigiles : sommeil et performances., Massive Open OnLine Course, Health and Social Sciences Master, at: http://bricage.perso.univ-pau.fr/sommeil.html, -Creative Commons free ShareAlike licence-)

Figure 2 Sleep agenda recording and semiological determination of chronotypes



- morning (**M**), evening (**S**) and rhythmic (**R**) types; genders: male (in **black**) and female; scoring: /20,

- *"experiments-design and record"* capabilities (left side): Comparison **within each chronotype** of morning and evening results, for the same tests. Later the testing, bigger the failure (**blue arrow**) of **Morning** types (in yellow). Later the testing, better the success (**orange arrow**) of **Evening** types (in green). Rhythmic types (in red) are both like morning ones -but with a higher variance- and evening ones -but with a smaller variance-. As previously evidenced (Figure 2), **Rhythmic** types are both *"neither Morning ones nor Evening ones" and "simultaneously Morning and Evening ones"* (**blue** and **orange** arrows), depending on the day of their endogenous rhythmicity (Bricage 1998a, b) -Creative Commons free ShareAlike licence-.

- *"talking-reporting"* capabilities (middle): Comparison of tests results **between chronotypes** depending on the hour for a very same test. Later the testing, bigger the failure (**yellow arrow**) of Morning types. Later the testing, better the success (**green arrow**) of Evening types. On the morning (the 3 upper distributions) Rhythmic types are **intermediary** between the Morning and Evening ones, with **a smaller variance**. On the evening (lower distributions) they are intermediary too, but got the best results.

- *"writing-reporting"* capabilities (right side): Comparison **within each chronotype** of morning and evening results, for the same tests. Later the testing, bigger the failure of Morning types (**yellow arrow**). Later the testing, better the success of Evening types (**green arrow**). Rhythmic types are both ***"neither** Morning ones **nor** Evening ones" **and** "**simultaneously** Morning **and** Evening ones"* (**violet rectangle**), depending on the day of their endogenous rhythmicity, but with the smallest variance.

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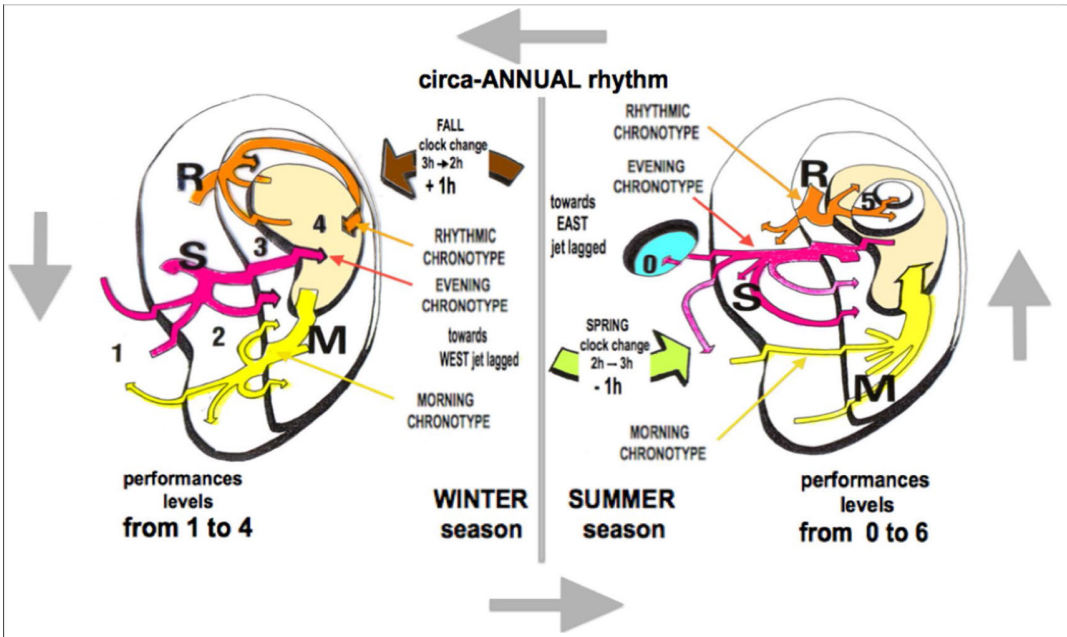
Figure 3 Chronotypes depending performances changes



- morning (M) -yellow-, **evening** (**S**) -**red**- and **rhythmic type** (**R**) -**orange**-, year run: **grey arrows**,

- Fall clock changes (left part): entering winter season (**big brown arrow**), hour is delayed (**-1h** jet-lag towards West), within a **4** degrees performance scale: **M** types performance decreases from 4 (*before the change*) to 3, 2 or 1 (*after the change*), **S** types one increases from 1 or 2 to 3 or 4, and **R** types one increases from 2 to 3 or 4 (as S types) and decreases from 4 to 3 (as M types, but less), or maintains at 4. (Bricage 1998a, b) -Creative Commons free ShareAlike licence-.

- Spring clock changes (right part): entering summer season (**big green arrow**), hour is advanced (**+1h** jet-lag towards East), within a **7** degrees scale: **M** types performance increases from 1 or 2 or 3 (*before the change*) to 4 (*after the change*), **S** types one decreases from 4 or 3 to 2, 1 or 0 or maintains at 3, **R** types one decreases from 3 to 2 (as S types, but less) or increases from 3 to 4, 5 or 6 (as M types, but more). (Bricage 1998b) -Creative Commons free ShareAlike licence-.

Figure 4 Performance changes depending on chronotypes and societal hour change. Comparison between chronotypes circa-annual rhythm responses.

Nowadays, genes involved in organisms time organisation have been identified (Ciarleglio et al. 2008) or sequenced (Lim et al. 2012). The 3 chronotypes are inherited with 3 alleles of the same gene. Knowing a person's vigil chronotype (figure 2) allows to plan for her/his drugs intake at the right time depending on her/his rhythmic schedule (Bricage 1993, 1999): that is chronotherapy! Taking into account the vigil chronotype allows to plan for the best time for the best performance, either for a student or a sportsman and for a particular risky or key activity. Results of students' competency tests (reports, talks, experimentations) are significantly increased (from 20% to 50%) when done AT THE RIGHT TIME (Bricage 1998a, b, 1999) (Figure 3).

Failures may result from external time

changes (such as jet-lag) which shift the interactive coordination between the external (ecoexotope) and endogenous (endophysiotope) times, thus causing clocks desynchronisation. Innate clocks or calendars are entrained by ecoexotope synchronisers (Zeitgebers). Desynchronisation (Figure 3) can be avoided and resynchronisation procedures can be enhanced by taking into account people's individual chronotype (Figure 4). Vigil chronotypes determination and respect is the best way to avoid scholars' failure.

2.3 Everyone Has Its Own Night Sleep Awakenings Rhythms but Man Is an Earth Clock Shaped Species

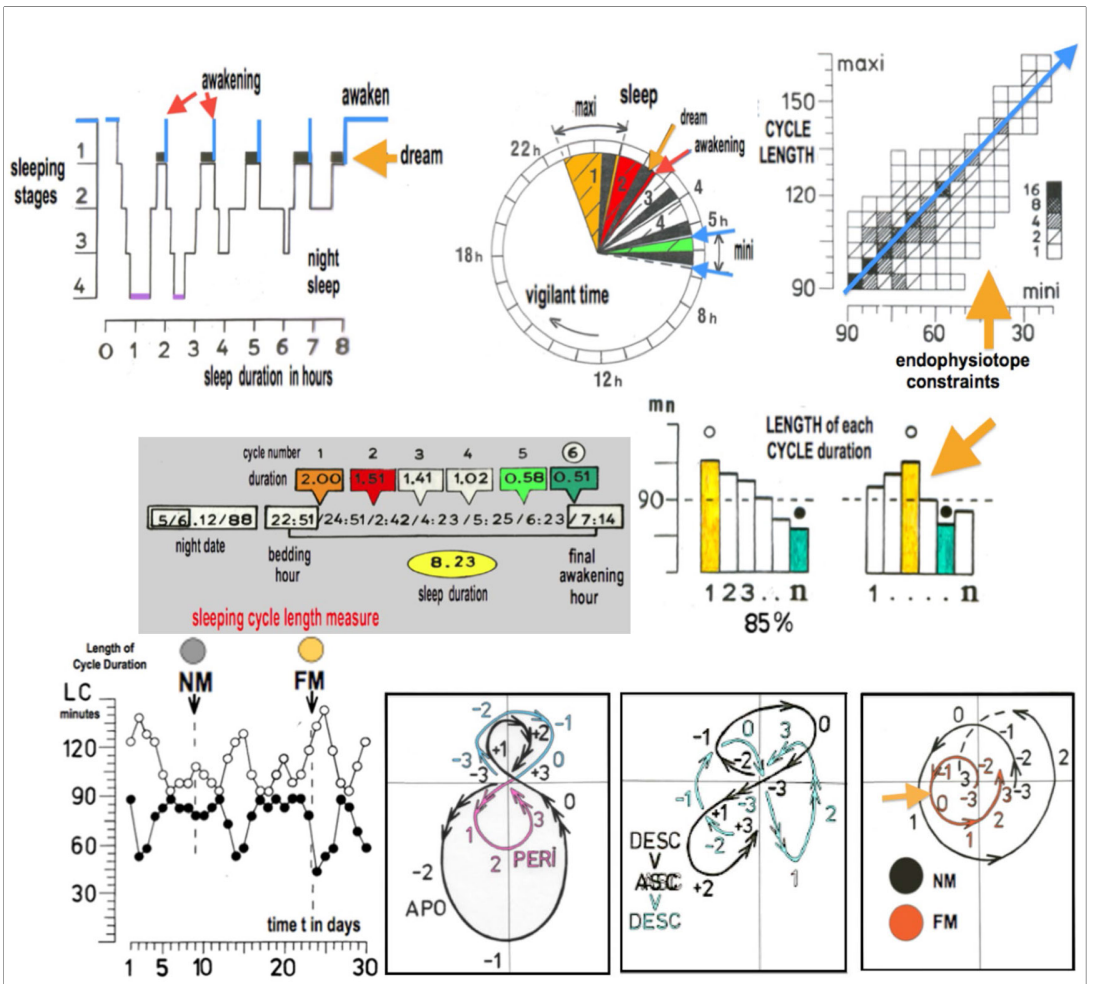
During a night, sleep is structured with cycles that end with dreaming (Saper 2015). Both the minimal and maximal durations of all cycles during a night obey a relationship resulting from interactions between endogenous and exogenous clocks. The changes of cycles duration can be modelled. All Earth living systems share a common ecoexotope of survival that is structured by solar, lunar and terrestrial rhythms.

These rhythms are synchronisers for our endophysiotope clocks. But some people are more sensitive to them than others while someones are more resistant (like with bacteria facing antibiotics). Since thousands of years these physical rhythms have been used by civilisations to improve their ecoexotope independence.

A multifactorial analysis has shown that sensitive persons have their sleeping cycles lengths structured by lunar calendars (Figure 5). The lunar cycle of apogee-perigee entrains individual sleeping rhythms along an analemma like curve calendar. The same entrainment is noticed with the lunar ascendancy-descendancy cycle, but with a different analemma calendar. For a lot of animals it is known that even if circadian rhythms and sleep behaviour are genetically determined (Steinmeyer et al. 2012), the light lunar cycle is a synchroniser too -as it is for bees for example (Mohssine et al. 1990)-. Man is not an exception! (Bricage 1993, 1997, 1998b).

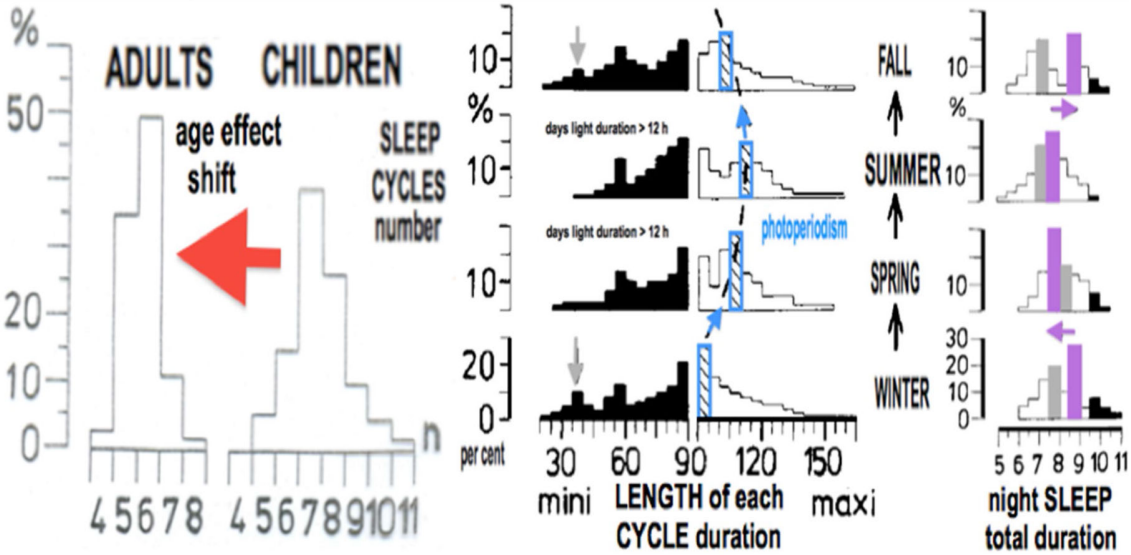
The equation of time we have to consider to trace solar time-tables is an analemma (Schwarzenbach 1983). The fact that we are functionally time-structured with both solar and lunar analemmas means that even if from a physical point of view the Moon is running around the Earth and the Moon-Earth couple is running around the Sun, our Earth-hosted organism is physiologically structured with Earth as a fixed point, and each of us a fixed point too, with both the Moon and the Sun apparently running around the Earth. Indeed the analysis of sleep records points to circa-annual solar rhythms to be considered as controls for the evidence of circa-monthly lunar rhythms (Figure 6).

A striking result is that, man's organism is running around the Moon candle just like butterflies are running around a lamp at night: obeying a spiral curve going towards the light when the light is "ON" and escaping when the light is "OFF" (Figure 5). Man is not an exception! But the lunar candle oscillates along a month duration calendar. So the endophysiotope of our organism, like all terrestrial living systems, is time-structured with endogenous physiological clocks that are "clocking up the biological hour" (Figure 1), the Earth day, the lunar month and the solar year (Figure 6), according to exogenous physical clocks signals.



- night sleep structure and sleeping cycle length measurement (top left): each cycle is ending with a **dream** (arrows) and an **awakening** (blue peak), awakenings times allow to know each **cycle length**,
- night sleep structure changes (top middle): usually (**85%** of nights) the longest cycle (in yellow) is the first one, the shortest (in green) is the last one and **length duration** (in min) decreases, but during nights which are close to a lunar event (apogee: **APO** or perigee: **PERI**, descending-ascending: **DESC>ASC** or ascending-descending: **ASC>DESC** phases transitions, new dark Moon: **NM** or full enlightened Moon: **FM**) the sleep pattern is different (orange arrow)
(Bricage 1993, 1997, 1998b) -Creative Commons free ShareAlike licence-,
- correlation between cycle durations (top right): due to endophysiotope constraints the longest (**maxi**) and the shortest (**mini**) cycles (in min) of a same night, are correlated maxi+mini= 2 duration **mean**= 2x **90 min**
- lunar calendars evidenced by multi-variate factorial analysis of correspondences (bottom left): for each cycle, **-3, -2, -1** is the days order before a lunar event, **0** is the date of the event (**APO** apogee, **PERI** perigee, **DESC>ASC** change, **ASC>DESC** change, **NM** new Moon, or **FM** full Moon) and **+1, +2, +3** is the days order after that event (Bricage 1993, 1997),
- night sleep cycles durations correlated changes (bottom right): the longest -maximum (**max**: **white** points)- and shortest -minimum (**min**: **black** points)- durations oscillate around the mean (**90 min**) in opposite ways.

Figure 5 Sleep changes depending on lunar cycles entrainment



-left- comparison of the number of sleep cycles **adults/children**: the cycles number, **n**, decreases with age,

-middle and right- seasonal circa-annual solar rhythmicity: **mini** and **maxi** (figure 5); the cycles lengths distributions obey a photoperiodic phenomenon: the longest cycle (**blue mode**) increases along the photoperiod increase (**blue arrow**) and the **sleep total duration** (**violet mode**) increases with the photoperiod decrease (from summer to fall and winter) and decreases as the photoperiod increases (from winter to spring and summer) (**violet arrows**).

(Bricage 1993, 1997, 1998b) -Creative Commons free ShareAlike licence-.

Figure 6 Sleep changes: controls

3. What Methodology to Evidence Temporal Organisation and Physiological Response of Living Systems?

We can use a transversal methodology when people are all obeying the same rhythm. But we need a rhythm which obeys a gaussian law... And usually that is not the case!

3.1 First of all Only Individual Longitudinal Measurements Must Be Used. No Massive Statistics!

We cannot use transversal measurements for chronobiology, that is to say a lot of different people with few days of longitudinal recording. The transversal methodology is used because it is easy to have a lot of people, to use sophisticated statistical tools to get interpretation rapidly and to publish as soon as possible ("publish or perish"). Populations are heterogenous (Zienolddiny et al. 2013) with poly-modal distributions of markers and effects (Bricage 1997). Uni-modal distributions are often not gaussian, and the sum of uni-modal distributions is rarely a uni-modal one.

The first systemic law is that "a system is always both more and less than the sum of its parts". So we cannot from the components have access to their sum and -reciprocally- we cannot from the sum have access to the components (Bricage 2001a, 2004, 2014). Even if we dispose of the Fourier transform tool, distributions of

data can be skewed and different from normal or log-normal ones. There is usually an unknown network of interactions between endogenous data and exogenous ones. Biological values, such as the body mass index -for example-, can shift depending on gender or age. Mean values have no biological meaning!

When rhythms are in interactions, diversity is high, variance is high, and it is difficult to find the same qualitative or quantitative behaviour phenotypes, so we must use individual longitudinal measurements (Bricage 1999). The great difficulty is thus to have enough subjects and to be able to follow their functioning along a statistically significant duration (Bricage 1993).

3.2 Controls Values and Latency Times Must Be Evidenced and Considered First

Plant transpiration studies (Brogärdh and Johnsson 1974) have shown a time controlled network of clocks (Bricage 2005): "time structures living-systems and living systems are structuring time too". Different wave frequencies are running depending on responses to endogenous or exogenous changes. Before evidencing a response to a stimulus, we must wait for a new steady state. Living systems have an endogenous memory, not only "on" stimuli but also "off" ones have effects too (Bricage 1985, 1986). The latency phase duration is always of at least 1 period of the rhythm (Bricage 2005). Before using data, we must thus have been running at least 1 period of the rhythm. It is easy for a circa-hour rhythm, longer for a circa-dian one, boring for a circa-monthly one, and there are annual rhythms and more... To have statistical significant results we must longitudinally record as much rhythm repetitions as we can. But with patience it works (Bricage 1993, 1999).

3.3 Stimuli Responses Must Be Tested according to a Double Blind Placebo Controlled Randomized Survey

Both evaluators and subjects must be in the dark to whom is getting real drug and whom is getting placebo. Once the test period is finished and all results are recorded, the identity is decoded, the real drug vs. placebo-control-group are compared for a true difference or not. An expert statistician reviews the results and determines whether or not there is a difference between groups that beats pure coincidence. A probability is assigned to each result (Bricage 1993). There is a X% confidence that the observed effect is physiologically real and not a random coincidence (Mirmohammadali et al. 2015).

4. What Methodology to Evidence Litho-Therapeutic Effects?

Thousands of years ago Chinese Medicine knew the reality of nerves ways into the body and congruence in nervous plexuses. Both acupuncture and feet reflexology techniques use reflex arcs reality (meridians) to treat diseases (Mazic-de Sonis 2015). In Indian Medicine, these plexuses are named chakras. We used a Chinese bi to treat the heart chakra. Before use, each bi (or pi) stone was purified, every time, by a 3 minutes water flowing procedure and then energetically charged during 7 hours by exposure to day light on quartz geodes.

4.1 What Mineral to Use for What? A "*A Priori*" Complex Difficult Process!

Urine release difficulties for male gender are often associated to prostate cells abnormal growth. (1)

4.1.1 Use of Jade, Nephrite, Serpentinite and Related Simulants

We used jade or nephrite (common Canadian and Chinese "jade"), which names originated from their ancient renown properties to act on kidney or nephron, to treat urination difficulties. But this supposed effect is a matter of discussion. The first difficulty was to identify commercial affordable sources of jade. Under the name of jade we find jadeite (a pyroxene group of stones) -which colour may range from white to yellow and dark green (and even with other colours: red, purple, blue, black) depending on the trace elements in it-, nephrite (an amphibole group of stones) and serpentinite (a stone of the serpentine group). Of course trace elements could change properties. The yellow jade which is the most affordable often is serpentinite (also called lizardite). Differences between jadeite, nephrite, serpentinite and other jade simulants can be evidenced through the measurement of their hardness (Mohs scale), density, light absorbance property and X-ray diffraction pattern which reflects their chemical type and crystal composition. Jadeite lattice is a granular material, but nephrite and serpentinite are fibrous ones. Serpentine class fibres are curly.

(Chrysotile, obtained from serpentinite rocks which are common throughout the world, has been used more than any other fibre type and accounts for about 95% of the asbestos found in buildings in America.)

4.1.2 Use of Red Jasper and Related Stones

Jasper is a dense and opaque variety of quartz. It is not really a mineral, but a textural variety, a mixture of different types of microcrystalline quartz with impurities, an opaque reddish-brown variety of chalcedony other than carnelian. The common red colour is due to iron. Traditional Medicines suppose red jasper enhances energy and courage for physical working. Jasper of homogeneous colour, like goldstone jasper, looks a bit like a coloured, opaque flint, and shares with it and carnelian many physical properties, but it forms in different environments. Multicoloured jasper is used as ornamental stone, and red jasper is cut as a gemstone. The classification and naming of jasper varieties is a challenge. Just like as it is with jade (generic name!) the difficulty is to identify what sort of jasper (generic name!) we get to work with? (Kostov 2010).

4.1.3 Use of Hematite

No problem for the identification of hematite, a black brilliant metallic coloured mineral, easy to obtain because it consists of ferric oxide, an important ore of iron. This stone is supposed to have a strong physical grounding energy. But because hematite has been used for a long time, a wide variety of healing properties has been ascribed to it. Many people wear stones or magnetic beads but that are made from reconstituted hematite.

4.2 Results: WHAT?, WHAT FOR, WHY?, HOW and WHEN?

All assays are tested with the usual time structure used as control. For each control, placebo or treatment, the day from day longitudinal records duration was 1+3 lunar cycles long, to have a 100 days long record out of the expected latency phase and to express results in %. They were obtained with 11 male subjects, from 60 to 71 years old, for the test of jade effect and from 5 male and 5 female subjects, from 25 to 70 years old, for the test of red jasper effect. Can we evidence stones properties using a double blind placebo controlled survey?

4.2.1 Scaling of Control and Placebo Records

All tests with jade, nephrite or serpentinite (or placebo stone) were made at night. Use of hematite (or placebo) was done before jade test, from dinner hour until going to bed. All tests with red jasper (or placebo) were done during day, from getting until the dinner. A special distinctive urination scale was used for night test and all results are expressed in % (Figure 7).

4.2.2 Controls: No-Stone and Placebo Records

No-stone (control) or placebo longitudinal records are showing the lunar side-effects that are used for control (Figure 7): they show the same type of interaction between lunar cycles we already knew to exist (Bricage 1993).

4.2.3 One Piece Effect

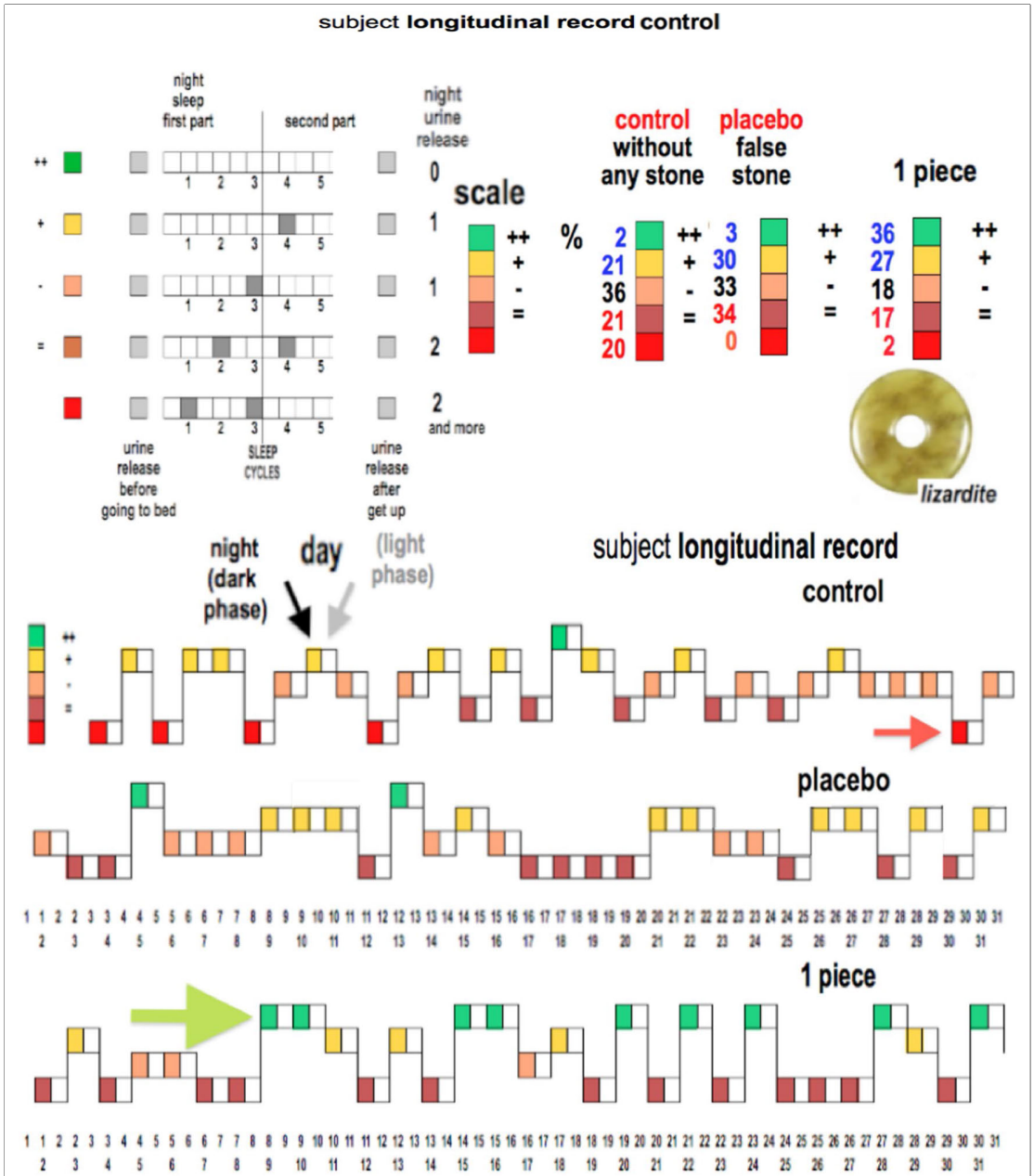
Compared with control, one 40 mm diameter bi piece of jadeite or nephrite -night dark phase treatment (Figure 7)- may enhance night quality (green arrow) with a decrease of at least 15 fold of awakenings and urinations. Nephrite suits better with a 20 fold enhancement of night quality (Figure 8). The highest of all placebo effects is below a 4 fold enhancement (Figures 7 & 13).

4.2.4 Influences of Crystal Lattice and Mineral Composition

The stone crystal structure was evidenced to have an action through the observation of at least a 40% loss of efficiency with a broken-glued serpentinite (or jadeite). Depending on the jade variety (and trace elements) the properties change. White jadeite has no effect (and eventually an adverse one) while translucent green jadeite allows the highest enhancement: a 22 fold effect (Figure 8).

4.2.5 Influences of Cleansing and Energy Charge

We may suppose on energy transfer because non-charged stones have no effect whereas energy charged non-efficient stones may have a 8 fold effect, twice greater than all placebos effects (Figure 8).



- top left- awakenings for urination **scale**: no urination **0** (best night quality, in **green**), only **1** urination during the second part of night (good quality in yellow) or during the first part (in **orange**), bad night quality with **2** urinations (in **brown**) and very bad night quality (in **red**) with more **2** urine releases,
- top right- results: in percentage **%**, for **control (no stone)**, **placebo (false stone)** or only **1 piece stone** (*bi* of lizardite here) -*bi* diameter: **40 mm**-,
- below- lines of **longitudinal records** (test at night): first **control**, second **placebo**, third one **lizardite** *bi*.

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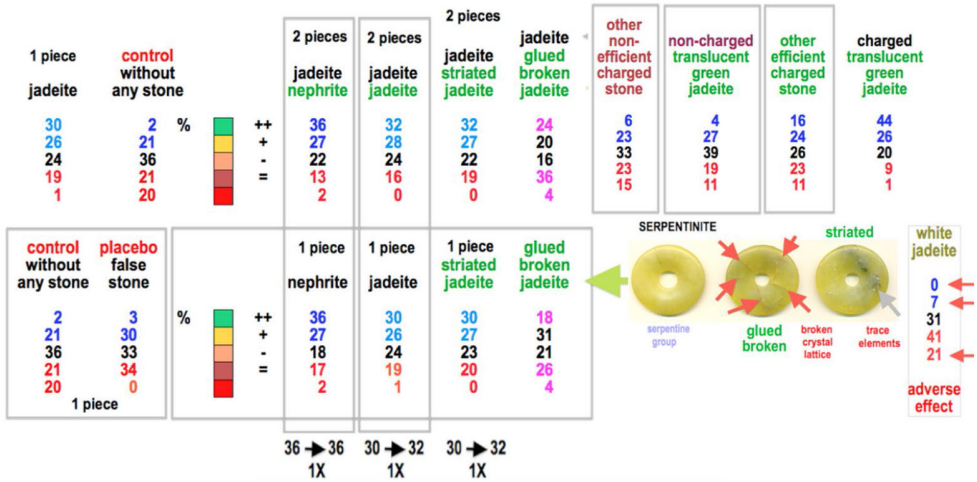
Figure 7 Example of results of a double blind placebo controlled test



- positive and negative controls (top left): 1 piece of **jadeite** for control of effect, no-stone for no-effect,
- no 2 pieces effect by comparison with 1 piece effect (middle, top and bottom): no difference between 1piece (of jadeite or nephrite) and 2 pieces (jadeite with nephrite, or with another stone) effects,
- white jadeite adverse effect (bottom right): **red arrows** indicating decrease in night quality,
- influence of crystal lattice integrity: glued broken jadeite or serpentinite loses 40% of its effect (**30** to **18**),
- influence of stone energization (top right): no difference between placebos and non-charged stones,
- *bi* diameter always 40 mm.

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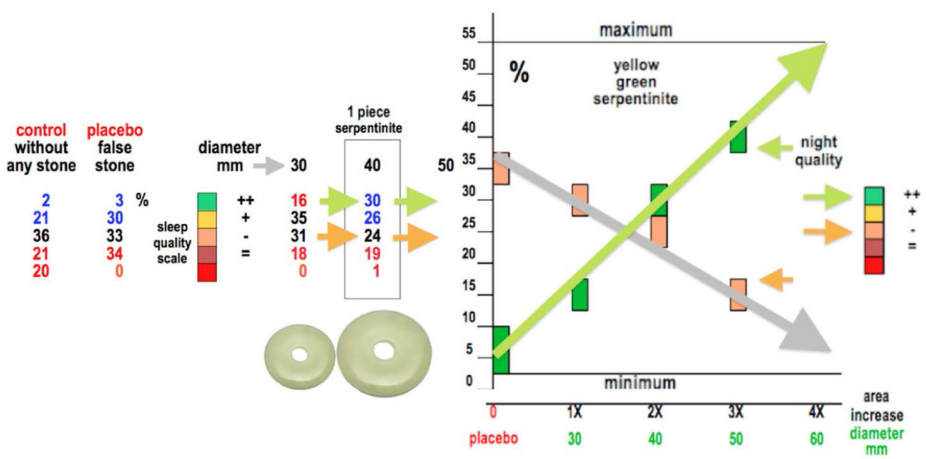
Figure 8 Factors influencing effects: energization, crystal integrity, number of stones



- influence of *bi* diameters on night quality (left): for 1 piece of serpentinite compared to placebo, *bi* diameters range from **30** to 50 mm, when **diameter** (**1X**) increases twice (2X) **area** increases 4 fold (**4X**),
- linear increase of night quality with *bi* surface area increase (right): with serpentinite the % of best nights (**green** spot of the scale and **green arrow**) increases inversely the % of bad nights (**grey arrow**) decreases, **maximum**: the highest observed value is a 22 fold enhancement (vs. control), which is obtained for successive treatment with hematite and serpentinite (figure 10), but the predicted maximum is a 27 fold value for a **60 mm** diameter *bi*, **minimum** is the highest placebo value (which ranges from 1 fold to 4 fold control values).

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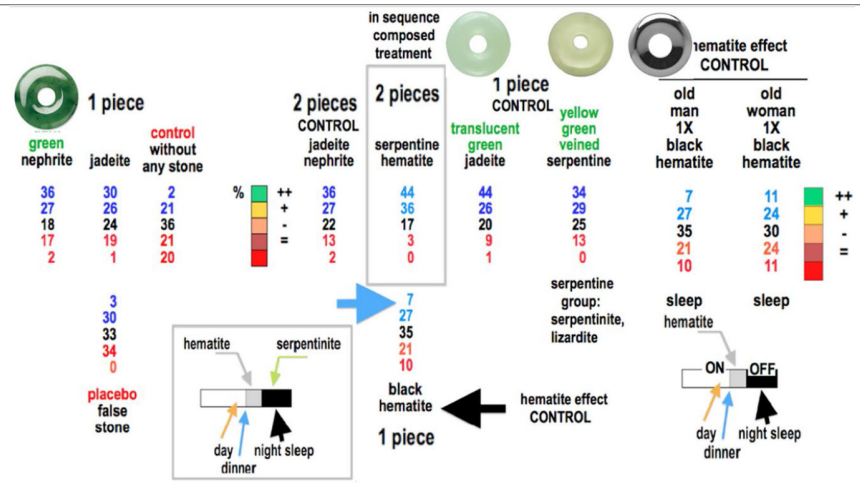
Figure 9 Influence of skin contact: a "dose dependent like" effect



- jade effect controls (on the left): no-stone, placebo-stone and 1 piece treatments (with nephrite or jadeite),
- hematite effect control (on the right): hematite treatment from dinner to going to bed,
- sequential treatment (middle): "2 pieces" control vs. treatment, compared with "1 piece" controls.

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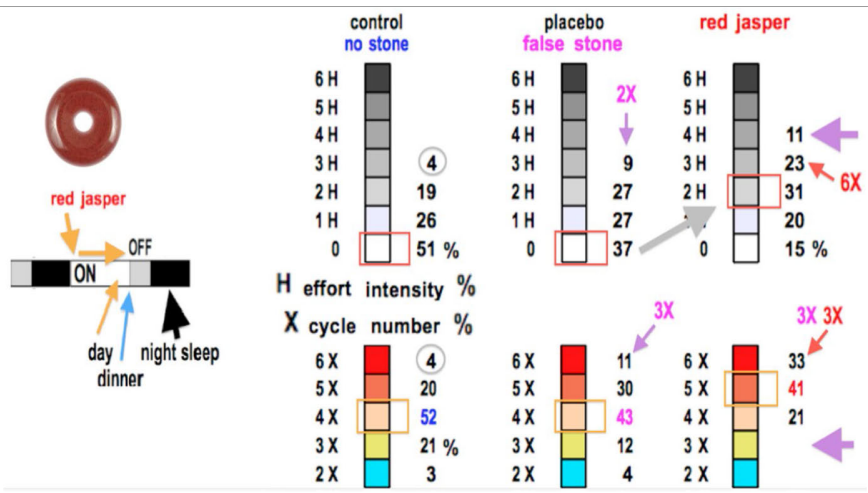
Figure 10 A double-blind placebo-controlled test of a combined sequential treatment



The diurnal phase is structured with cycles just like the night one is (Figures 5 & 6). For each cycle of working, only a 2 intensities scale is considered, moderate or high **H**, **X** being the number of cycles. For each diurnal phase, the number of cycles **X** and the amount of high intensity cycles **H** are graphed. The mode of the observed distributions is indicated with a **rectangle**. Compared to placebo, the highest cycles number (**6X,** red part of the scale) increases 3 fold (**3X**), compared to control the placebo-referred highest intensity (**2H**) increases **6X**. Placebo effect is greater during the light phase than during the dark one.

- no-placebo control (left part): cycles number mode **4X**, **51%** of cycles with **no** high effort (**0**),
- placebo (middle part): cycles number mode **4X**, **63%** cycles with **at least 1 H effort cycle** (from 1 to 3),
- red jasper effect (right part): cycles number mode **5X**, effort mode **2H**, **from 1 to 4 cycles of high effort**

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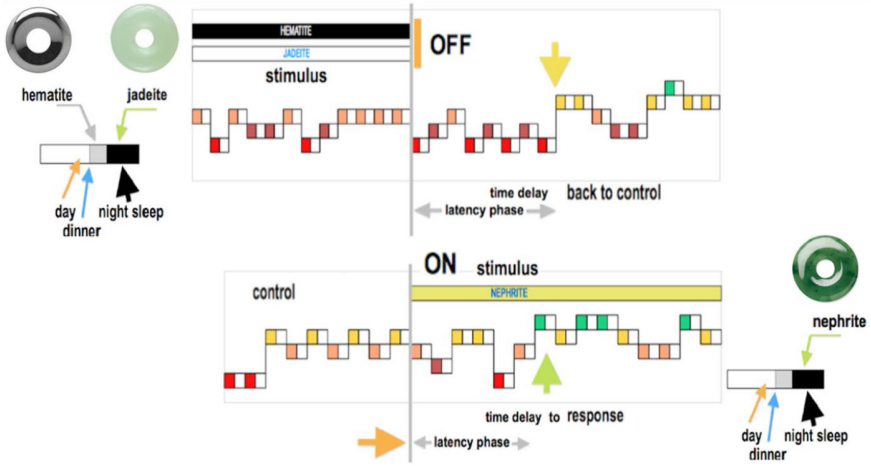
Figure 11 Evidence of red jasper effect (bi diameters 40 mm)



- end of a stimulation phase (top, left part): ***stimulus*** using false jadeite with no effect (or adverse one), right part: beginning of the following no-stimulus phase (**OFF**), back to control evidenced (**yellow arrow**),
- down, left part: end of a ***control*** phase, right part: beginning of a stimulation phase (**ON**) ***stimulus***,
- ***latency phases*** (greyed arrowed): time delay back to control (top), delay to response (down **green arrow**).

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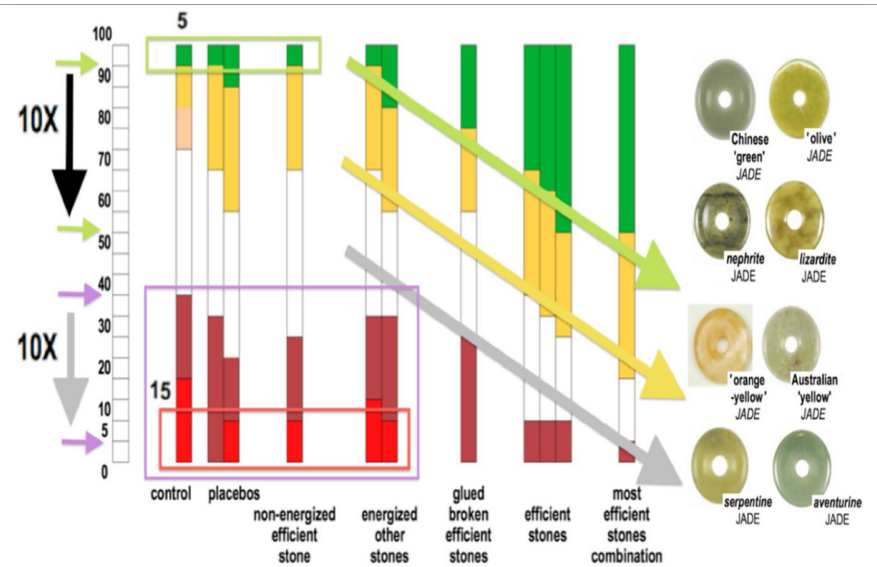
Figure 12 Shortening of the latency phase, a new Whole emergent property



0-100 percentage of each effect class, each in its **green**, **yellow**, ⋯, **red** colour according to the global scale (Figure 7), **green** for the best night quality, **red** for the worst one. The highest amount of best night ranges from 5 (**control**) to 10 % (**placebos**), the highest amount of worse nights ranges from 15 (control) to 0% (placebos). Only cleansed and energized intact stones are efficient. Efficiency depends on the stone (*pis* tested on the right: aventurine is placebo, most efficient stones are green translucent jade, nephrite, serpentinite and lizardite), **10X** net global increase for night quality.

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Figure 13 Governance of minerals effects to treat night urination difficulties

4.2.6 No 2 Pieces Enhancement Effect

With a "1 stone treatment" (green jadeite, nephrite or serpentinite) the best night quality (green class) increases at least 10 fold: from 3% (for placebo) to a range between 30% (for striated jadeite) and 44% (for translucent jadeite). There was no difference with a "2 stones treatment" (Figure 8)! The limiting factor is not the volume of stones but the area of contact between a stone and the skin (Figure 9).

4.2.7 Placebo Effect and Test Timing

It is more difficult to built a scale for red jasper quantitative effect than for qualitative ones. The day phase of our life is structured in cycles just like the night phase is. Even if the placebo effect is greater during the conscious day phase than during the unconscious night phase, red jasper treatment significantly enhances the number and the intensity of efforts during the day cycles of physical working (Figure 11).

4.3 Discussion: WHAT Mineral To Use FOR WHAT Purpose? A *"A Posteriori"* Easy to Explain Process

The simultaneous use of 2 bis does not show more effect than using only 1 (Figure 8).

4.3.1 Minerals Properties Act the Same Way Drugs Properties Do

The enhancing effect increases with the bi diameter, just like in a dose-dependent manner (Figure 9). We may thus consider a transfer energy effect, "from surface to surface", increasing with the contact area.

4. 3. 2 Evidence of Synergistic Effects

Using hematite before serpentinite, jadeite or nephrite, enhances their effect (Figure 10). As it is with chemical agonists, minerals may act in synergy. Hematite sole gives a slight effect: from 1 fold to 4 fold placebo value. But hematite increases serpentinite effect from a 15 fold value up to a 22 fold value (Figure 10), the maximum. (Maximum which is probably limited by lunar influences.)

4.3.3 As a Whole, a System Is Defined by Some Unanticipated Emergent Properties

That is exactly the case! We could logically suppose that within an interactive network of clocks, the latency phase of the whole will be greater than the shortest latency phase of each clocks (equal to their sum for example), but surprisingly the whole latency phase is reduced (Figure 12). Considering a network of 3 circa-monthly lunar rhythms (Figure 5), each with a latency phase of a 1 cycle duration, their Whole is getting a 4 fold reduced latency phase, thus enhancing the system reactivity to change.

Times are embedded and juxtaposed just as spaces are (Bricage 2013, 2015). The Whole is both more and less than the sum of its parts (Bricage 2004, 2014).

Of course, due to the unique interactions (Figure 1) between each individual endophysiotope and its population commonly shared ecoexotope (Bricage 1997, 2002b), lithotherapy effects are obviously variable in a great range (Figure 8) and greater than placebo effects changes (Figure 13). As it is with drugs, different minerals (and lunar cycles) sensitive degrees exist (Bricage 1993, 1997) that are depending on the individual inherited

endophysiotope (Figure 13).

Quick "emergency and recovery", fast urgent curing, are not fit for chronotherapy and lithotherapy but "maintenance and prevention", smooth steady state equilibration (Bricage 1999) or punctual energizing (Figure 11) certainly are.

5. Conclusion

We must consider not only first order models or second order ones for statistical use (Bricage 2013) but more... All living systems are *n* cybernetic order system-of-systems. Their endo-physio-topes and eco-exo-topes are juxtaposed and embedded just like matryoshka dolls are (Bricage 2002b). The endophysiotope of an *i* level of organisation is an ecoexotope of survival for other *i-j* levels. The same *i* level ecoexotope is shared between endophysiotopes of different organisation levels (Bricage 2001a, b).

Local problems always give rise to global systemic problems (Bricage 2004). Systemic solutions must arise both at local and global levels (Bricage 2004).

Times are embedded and juxtaposed just like spaces are (Bricage 1986, 2002b, 2005). A global healthcare, but for an individual welfare, requires to determine and respect individual endogenous clocks (Figure 2) in adequacy with their respective exogenous calendars (Figure 3) (Bricage 2013).

Despite their systemic adverse effects, herbicides, pesticides and antibiotics are always systematically used (Bhattacharya and Mukherjee 2015). Fortunately chronotherapy is used for knowing cancer origin and treatment (Zienolddiny et al. 2013) because it allows to reduce the amount of drugs and their side-effects (Lévi et al. 2008), and also because of the drugs increasing cost (Tarhini et al. 2015)! Unfortunately the usual thinking is not a holistic systemic one but an analytic, and step by step one, coupled with an increase in new drugs research for added treatments to treat adverse effects (Lolignier et al. 2015). Both holistic and analytic methods, with bottom-up and top-down recursive ways, are necessary. Acupuncture is a common practise (Mazic-de Sonis 2015) but lithotherapy is not. Bis of hematite and serpentinite are affordable, easy to obtain, and not subject to imitation. Lithotherapy and massage with essential oils (Mirmohammadali et al. 2015) are smooth ways for an individualised, easy to use, non-violent and non-invasive therapy to treat chronic pathologies and help people in their everyday life. Of course, we don't know what hematite property (Figures 10 & 12) is acting on biorhythms frequency (Ulmer and Cornelissen 2013) or what red jasper property (Figure 11) is acting on effort intensity but it works! A new way for research is opening.

Asbestos mining existed more than 4,000 years ago but large-scale mining began only one century ago. Asbestos was used for insulation due to its desirable physical properties (sound absorption, resistance to fire, heat, electrical and chemical damage) and its affordability... until the carcinogenic effects (1) of asbestos dust caused its effective demise as a mainstream construction and fireproofing material in most countries (100,000 people in the United States have died, or are terminally ill, from asbestos -or amiantos- exposure related to cheap building). Health issues related to asbestos exposure can be found in records dating back to Roman times. Surprisingly serpentinite bis act as a solution for urination

problems... in a similar way than homeopathy? And maybe as inhibitor of prostate growth? Today, cancer therapies are still extremely violent and invasive (Bhattacharya and Mukherjee 2015, Lu et al. 2015). A new way for research is opening.

Lithotherapy is used in cosmetology and "modern medicine" but only with special minerals for special uses. New holistic oriented approaches -versus partial analytic ones- are on the way but experimental testing must be designed. New sample analysis methods should be used or developed (Hu et al. 2015).

A new way for research is opening.

The discovery of the emergent property (Figure 12) -which is a great advantage for living systems survival- that an interactive network of clocks (the whole) has a reduced latency phase compared to each clocks separately (the parts), allows the system to spend less time waiting for an effect.

Chronobiology is a way of thinking, not only for knowing diseases causes (Kripke et al. 2013) and to elaborate treatments (Figure 13), but also for apprentice assisted learning (Figures 3, 4): the right interaction, at the right place and the right time, for the right person, with the right person.

New ways for research have just emerged.

A toxic "cocktail effect" has been discovered with "beneficial" drugs (Delfosse et al. 2015).

We are just now knowing that everyone has got an innate endophysiotope temporal structure (Bricage 2014, 2015) with a unique pattern of ageing (Belsky et al. 2015) and that our birth date may influence, all our life long, the kind of diseases we are sensitive or resistant (Boland et al. 2015). We now know we need an "individualized handcrafted medicine" (Bricage 1998a, 1998b) and not a mass industrial unsustainable one.

Whatever the therapy we use, "there are never advantages without disadvantages" (http://armsada.eu), but "The creation of a sustainable society depends on the emergence and application of innovative systems thinking" (Bricage 1997).

6. Appendices

(1) This work is devoted to Prof. Dr. Ranulph Glanville, late IASCYS Vice-President, and founding member of the International Academy for Systems and Cybernetic Sciences (http://iascys.org), who died, after a lot of pain, from a ravaging prostate cancer.

(2) Complementary data are available at: https://hal.archives-ouvertes.fr/hal-01211365
Bricage P. (2015) A better healthcare for a better welfare? Chronobiology and lithotherapy: sustainable systemic solutions. 19 p. <hal-01211365> (Creative Commons free ShareAlike licence).

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