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EDITORIAL

-Paolo Manzelli

- The future prospects of creativity in science is now open to a deep revisiting of strategic thinking about the relationships between :Thermodynamics and Life Sciences .

- Science till today is normally focused on limited priorities of mechanical bases of understanding of the old industrial society. This reductive approach nowadays is no more able to understand a coherent development based on the integration of trans-disciplinary science. Prof. Giorgio Piccardi (1895-1972) (see: http://www.cifa-icef.org/piccardi_ita.html) was the Director of Institute of Chemical Physics research works to understand the influence of the universal electromagnetic field spectra on a open thermodynamics system . The research work of G.Piccardi it is today very important to a new beginning of researchers about the study of Life Sciences Evolution . As a matter of facts Piccardi Study's initiate with the research of the easy reproducible STORM GLASS, (known as chemical barometer) that is composed by the following chemical substances closed into an hermetically sealed glass tubes it is contained supersaturated mixture following chemicals.; 2.5 gr.Potassium Nitrate + 2.5 gr. Ammonium Chloride + 33 ml of Distilled Water + 40 ml Ethanol, + 10 gr. camphor . The Idro- alcoholic STORM –GLASS solution it is closed in a test tube and tacked into a constant temperature ; so that is no influenced by the thermodynamic variables (i.e. -: Temperature , Pressure and Concentration).

A similar test tube was utilized by the admiral Robert Fitzroy , commander of BEAGLE the vessel participated to the world wide of the famous Charles Darwin's expedition around the world. Fitzroy believe that the alchemic mixture, containing camphor, ammonia, alcohol, potassium nitrate, and water, was most suitable for weather meteorology forecasting in respect of the Torricelli Barometer used until 1643. So that in the Robert Fitzroy Weather Book of Beagle Shipp (1843) , he described the various forms of the growth of crystal shapes and patterns of Camphor that develops within the storm glass according to different wind directions and weather conditions . Therefore G.Piccardi, develop a chemical Physics studies of Storm Glasses and other chemical precipitates , taking in clever attention those out of equilibrium data for understanding, way the camphor's crystal grows can give a forecast about meteorology in a context of a study of out of equilibrium thermodynamics. G. Piccardi obtains very good results by means the research made in Florence, that permits to discover the influence to all chemical reactions of of solar electromagnetic field in the context of out of equilibrium dynamics of chemical and biochemical reactions. Till now the research of G. Piccardi was mostly considerer by academic science as well as a contribute very far from the traditional scientific approach, so that only few scientists belonging to the CIFA (The International Committee of Research and Studies on the factors of the Environmental Evolution) is till now considered as an advanced science approach , that nowadays is becoming to give a clear attention about the new beginning of scientific research oriented to improve scientific multidisciplinary knowledge.

The “ ON-NS group in Florence “ starts for improving new rooting growth of science innovation , by means a revisiting of strategic thinking of science in the field of the impact of the universal electromagnetic spectrum on the life science evolution. Certainly the difficulties about the needs of a deep rethinking of science starting form the ancient scientific observations seems a very hard job, for the difficulty to put in understanding the fundamental scientific queries of science to the attention of specific disciplinary contemporary scientists. In any case the scientific work of Giorgio Piccardi is based on a “Galileo Galilei” method of direct observation of Nature and therefore is based on easy reproducible chemical experiments (like : Storm Grasses, Liesegang Rings, and Oscillating Reactions) , so that the difficult of understanding it is only due to the difficulty of brain - flexibility due to the of extreme specific division of science growth realized during the Industrial society. Nowadays we assist to a complex transformation of the post Industrial society into the world -wide KNOWLEDGE SOCIETY ; therefore the new beginning of creative research , based on an approach that will be able to overcome the mechanical character of traditional science , can be very relevant for opening a new paradigm of future science development of living system understanding in the context of the future world-wide KNOWLEDGE SOCIETY.

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<http://www.google.it/search?q=GIORGIO+PICCARDI&hl=it&lr=&start=10&sa=N> ; <http://www.orgonlab.org/cgi-bin/shop.pl/page=yweather.htm>

<http://www.julianrubin.com/fitzroy.html> ; http://www.edscuola.it/archivio/lre/chemical_bases.htm

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New from presidency of CIFA

--- Natalia Udaltsova <udanat@yahoo.com> wrote:

> Date: Sun, 10 Apr 2005 08:57:48 -0700 (PDT)

> From: Boris Vladimirovsky <bvlad@yandex.ru>

> Subject: Official communication for Dr Faraone

> To: udanat@yahoo.com

>

> Dear Natalia,

> Please forward this to Dr.Faraone.

> Thanks, B.M.

> P.S. I have problems with e-mail sending...>>

>

<< **March 30, 2005**

>

> **From: Prof. Boris Vladimirovsky, President of CIFA**

> **To: Dr. Piero Faraone, vice-president of CIFA, and CIFA Board of Directors**

>

> **This is an official communication about accepting candidature of Prof.**

Paolo Manzelli for position of CIFA General Secretary. I hope that CIFA will benefit

> **from close connections to Florence University.**

> **Prof. Boris M. Vladimirovsky,**

> **CIFA President >>**

GIORGIO PICCARDI:

FLORENTINE GENTLEMAN, SCIENTIST AND TEACHER BY VOCATION

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The words Isaac Newton used to describe his own work well suit the personality of Giorgio Piccardi: *“I do not know what I may appear to the world; but to myself I seem to have been only like a boy, playing on the sea-shore, and diverting myself, in now and then finding a smoother pebble, or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me”*.

Giorgio Piccardi (1895-1972) was for some aspect an eclectic chemist as his career embraced many fields of research. An intellectually lively personality, he continually found new veins of research in all that surrounded him. His mind was a source of new hypotheses and reason which carried him forward along with many of his colleagues, but Piccardi himself never stopped the process of construction and demolition, demonstrating a critical acumen without rival. His true nature, which was respectful of life but deeply secular and agnostic, could be said to have been equally directed toward all the wonders of Creation.

After returning from the war, his first studies following graduation from the University of Florence (1921) were directed toward an attempt to establish a correlation between the energy of ionisation and the periodic properties of the elements. His great teacher, and later his friend, Luigi Rolla (1882-1960) involved him in his pioneering work and also in that which followed. It was in those years that Piccardi demonstrated great skill in the field of spectroscopy. The work which absorbed him up until the Second World War was quite courageous: the fractionation of rare earth minerals in search of the last element, *florentium*, unfortunately an unconfirmed discovery. Piccardi personally attended to the fractionated crystallisation and spectroscopic study of the grade of purity of more than 50000 samples containing samarium: it was a huge undertaking. His passion for science can be underscored by nothing from 1921 to 1938, when he was awarded professorship at Genoa, he was a simple volunteer assistant! The war brought drastic changes to his research interest; in 1945 he returned to Florence with a temporary

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position yet remained there until the end of his career. In the last twenty-five years of his life, Piccardi focused his research on the study of time as essential coordinate of the dynamic of natural processes. He investigated the so-call *fluctuating phenomena*, or rather non-inertial evolved process as subjects influenced by external forces exposed to exchange of energy and/or matter. Among the agents, he also considered terrestrial, solar and cosmic variables. He studied several chemical reactions in aqueous solution (the hydrolysis of bismuth chloride which in water generates a with semi-dispersed precipitate, BiOCl) and observed the phenomenon of *activation* of water when it is subjected to the action of long-wave electromagnetic fields. Piccardi noted that the time factor is not homogenous for each successive instant. He hypothesised regarding the experience of not perfectly reproducible phenomena which deserve to be studied scientifically; in other words those phenomena or processes which involve the action of low frequencies and very small energies which are considered insignificant because they produce very small effects. Time as a succession of equivalent instants is the basic dogma of mechanistic science. However, nature does not follow these canons. To reaffirm his hypothesis, Piccardi wrote: *Not being able to reproduce the condition in which a test is carried out, there is the problem of recording the instant and period of time in which the experiment is carried out. One hour is not identical to another one precisely because phenomena are fluctuating. The date and hour characterise a physical situation which changes over the course of time. Time in chemistry, biology and perhaps psychology and sociology is not only a duration but a coordinate. Some objects are sensitive to these spatial actions and others are insensitive, and among the latter are aqueous systems and colloidal one in particular.*

From Piccardi's tests it emerged that sun spots and consequential phenomena have an influence on chemical reactions. One of the most important factors is the annual cycle linked to variations of the position and velocity of the Earth in its helicoidal movement with respect to the galaxy, due to the composition of elliptical movement of our planet with the rectilinear one of translation of the sun toward the constellation of Hercules.

In March when the Earth moves on the equatorial plane and its velocity is at a maximum, the coagulation of bismuth salt is (on average) low, while it is high in September when the movement of our planet is perpendicular to the equatorial plane and its velocity is at a minimum.

Giorgio Piccardi presented his "solar hypothesis" in the book *The Chemical Basis of Medical Climatology* [Charles C. Thomas Publisher – Springfield IL USA, 1962; purchasable on Internet at the price of 37 \$]. The scientist died on the night of the winter solstice in 1972, as Giovanni Speroni and Enzo Ferroni pointed out for the commemoration of Giorgio Piccardi, The Italian Physical Chemist and Master of the Sun, as the American G. B. Kauffman defined him. Giorgio Piccardi was an understanding friendly and quite man, but he was also decisive and determined. He was an affectionate

and generous father of three daughters, whom he cared for and loved. His role as “maestro” for his students, collaborators and family was constant, incisive and unforgettable. His teachings were not limited only to chemistry, but also many other fields such as sailing astronomy and painting. Giorgio Piccardi was the first to introduce the study of interphases and surface phenomena (he patented the double-wire tesimeter, which is kept at the Museo della Scienza in Milan).

Piccardi, with his two decades of work, opened up an innovative path into science, but after his death the research was carried on prevalently abroad.

In a certain sense he renewed the scientists ideas: he was a forerunner of inter-sciences and travelled new roads that many of his colleagues refused to follow or simply to understand. Now, after many years, it can be said that what he accomplished was not in vain because his work and ideas have not been lost but continue to live on .

PANORAMICA delle INDAGINI e APPROFONDIMENTI sulle CSD realizzati dal 1970 al 2005.

Considerazioni ricavate dalla pubblicazione dell' A. < Le CSD (colonie a settori differenziati) e i loro possibili parametri cosmofisici di confronto >, Il Bassini, Presidio. Osped Edit., Cinisello B (Mi), vol. XXV, Genn.- Giu., 2005, 10).

Faraone Piero, Vice Presid. C.I.F.A. (Pushchino [Moscow] / Roma), Membro dell' Accademia Internaz. delle Scienze (Milano), BIOCOS project Member, for microbiology, MN, U.S.A.

E' sempre più invitante la ricerca di parametri fisici utili per individuare possibili correlazioni fra energie provenienti dallo spazio esterno all'atmosfera e più in particolare alla biosfera .

Dopo le metereopatie , allora , sarà il turno di poter parlare anche di cosmopatie ?

G. Piccardi cercò di dimostrare una possibile influenza delle energie esterne alla biosfera , utilizzando test colloidali (1) e ottenendo correlazioni interessanti fra i suoi dati e l'attività solare, tenne a sottolineare che i risultati da lui ottenuti, non potevano perlomeno in alcun modo essere dovuti al caso .

In una sua relazione presentata a Montreux nel 1969 (2) fra l'altro disse :

<< ...Non posso sperare di venire a capo di questa fenomenologia appena intravista.....- e ancora -E' evidente che i sistemi sensibili, e soprattutto gli organismi viventi, possono mostrarci ciò che di profondo esiste nell'universo e mostrarcelo meglio degli strumenti di fisica....- e concluse -...La parola sarà ancora una volta allo studio dei fenomeni fluttuanti ed alle scienze della vita >>.

Fu una deduzione che Piccardi trovò logica ma apparve essere agli occhi dei tanti che lo ascoltavano, pure un buon auspicio per coloro che avrebbero fatto propria la sua profonda intuizione, agendo poi di conseguenza .

E' auspicabile quindi che lo studio della frequenza delle CSD nell'ambiente, possa essere considerato uno dei tentativi possibili ad aver messo in pratica, volenti o nolenti, quanto a Montreux, Piccardi addì pubblicamente.

Dal 1970 al 1991, l'A. ha operato nella sua ricerca sulle CSD osservando le colonie batteriche cresciute su un terreno colturale solido dove, come é noto, una colonia acquista la sua forma rotondeggiante grazie al modo in cui i germi all'atto di moltiplicarsi, si assemblano man mano fra loro in senso centrifugo.

Alcune delle colonie cresciute apparivano con la particolare caratteristica di evidenziare nella propria compagine uno o più settori che crescendo insieme ad essa, da questa si differenziavano per qualche carattere come il colore, la trasparenza, lo spessore o l'aspetto in generale.

Per brevità è stata attribuita a tali colonie la sigla **CSD** che sta a significare cioè *colonie a settore differenziato* .

L'A. notò che il numero delle CSD, come frequenza temporale, variava rispetto al numero delle colonie di aspetto normale, dal che decise di seguire il fenomeno più a lungo, sempre meglio convinto di dover continuare l'indagine (3 -14) fino a ricavarne un' informazione che riscuotesse un benché minimo di interesse .

Così come é scritto da diversi studiosi (4-11), c'era la grandissima probabilità che CSD valesse come sinonimo di mutazione e cioè di cambiamento genetico a livello di cellula batterica.

Infatti varie furono le conferme in tal senso, nella letteratura (4). Fra le varie ipotesi si considerò anche quella di un input d'energia esterna che potesse attivare a fago , un profago già presente nella cellula batterica, attraverso il noto meccanismo della transduzione ; il fago poi poteva benissimo indurre nel germe, una modificazione genetica (15) dando la CSD.

La fluttuazione di frequenza delle CSD fu oggetto di uno studio realizzato in due fasi successive:

La prima osservando dal 1970 al 1982, colonie originate da batteri provenienti dalla miscelanea di germi in sospensione nell'aria esterna;

La seconda, osservando dal 1984 al 1991 colonie originate da stipti puri di Staphylococcus Aureus conservati in laboratorio.

Tale micrococcacea fu scelta perché nella fase precedente riguardante l'aria esterna, aveva presentato una frequenza delle CSD chiaramente più elevata.

I test con i germi dell'aria, furono fatti pressoché ogni giorno, servendosi di piastre di terreno solido [Tryptose Agar] poste aperte a raccogliere la sedimentazione spontanea dei germi.

I test con ceppi di laboratorio, furono eseguiti seminando ogni giorno una loro brodocoltura di Stafilococco Aureo sulla superficie del terreno solido prima citato (6, 11).

Dopo l'opportuna termo-incubazione dei terreni, si consideravano il numero delle CSD come percentuale del totale di tutte le colonie contate, precisando che una CSD era conteggiata solo in virtù della presenza di uno o più settori e non in dipendenza del numero dei settori presenti in essa .

Nel complesso nelle due fasi, più di 4 milioni di colonie furono esaminate, con una media per ogni lettura di 200-250 unità per i germi dell'aria e di 300-350 per gli stafilococchi .

Un esame preliminare aveva suscitato perplessità sulla possibilità di una agevole interpretazione dei dati che si sarebbero avuti.

Le colonie batteriche in esame, infatti, provenivano da germi che prima del loro prelievo restavano soggetti a condizioni d'ambiente molto differenti tra loro .

I germi dell'aria, ad altitudini variabili e per tempi indeterminati, restavano esposti a condizionamenti non controllabili.

Per di più restavano suscettibili ad influenze ambientali maggiormente diversificate, in quanto condizionate dalla differente sensibilità ad esse dei loro substrati, propri di varietà batteriche di specie e di generi diversi. Eterogeneità queste che potevano non essere il mezzo più idoneo ad inquadrare al meglio, il fenomeno CSD.

I ceppi di laboratorio invece costituiti da singole specie di S. Aureus , tenuti in condizioni standard, abolivano le perplessità avute per i germi dell'aria.

I risultati reali comunque smentirono tutti questi timori, proprio per il carattere dominante espresso dal fattore o dai fattori condizionanti il fenomeno CSD.

Si ebbero all'interno di ogni anno sia per i germi dell'aria che per i ceppi di S.Aureus, variazioni di frequenza delle CSD col carattere tipico dei fenomeni fluttuanti di piccardiana memoria, dando valori minimi in genere a marzo e settembre (in questultimo meno netti e costanti) e valori massimi in genere a giugno, agosto e novembre (in questultimo più elevati).

Si avanzò l'ipotesi (4) che l'aumento di numero delle CSD, fosse dipeso dall'influenza di energie agenti all'esterno, ma non si escludeva la possibilità che questo potesse avvenire altrimenti, vale a dire pure in ambienti separati dall'esterno (ambienti confinati) .

Ciò poteva accadere o quando i germi erano in sospensione nell'aria, provenendo magari da grandi altezze(16-17) ovvero e soprattutto durante la crescita sui terreni colturali.

I germi in sospensione nell'aria notoriamente non si riproducono : resistono (*magari mutati*) o muoiono.

Scopo della seconda fase era appurare se i fattori fisici avessero influito sulla comparsa delle CSD pure all'interno di ambienti confinati : schermati cioè da pareti e da presenza di barriere artificiali come nel caso dei contenitori in generale presenti in un laboratorio .

Quanto visto nella seconda fase, fu meglio sviscerato nel novembre 1990, attraverso esperimenti quotidiani, contemporanei di un totale di 51 mila colonie circa, nell'arco di 12 giorni di seguito.

Le CSD, a livello del mare davano frequenza minore rispetto a quella avuta in altitudine con esclusione della galleria (sotto lo spessore di 1400 m di roccia),dove nonostante la quota, si ebbero le frequenze più basse.

Un'energia penetrante dunque che oltrepassava tanta roccia , pareva influire sulla frequenza delle CSD meno che all'esterno sia in quota che a livello del mare .

Per finire, nelle due fasi degli esperimenti fu notata una concorde frequenza delle CSD e meglio in risalto nelle medie annuali.

Le 2 fasi considerate unite, assumono un più completo valore scientifico.

A tale valore contribuirono pure coloro che studiando statisticamente i dati CSD raccolti, rilevarono significative correlazioni di essi con vari fattori fisici ipotizzati dall'A.:

l'Attività Solare (NW e flusso solare con range di 2800 MHz).

l'Attività Geomagnetica (e le tempeste magnetiche).

le Onde ELF (onde elettromagnetiche di bassa frequenza).

Energie tutte in correlazione negativa, con la frequenza delle CSD.

Dei **fisici** che cooperarono si ricordano :

nel 1984 (5) **M.DeMeyer** (dell'Osservatorio Astronomico di Liegi),

nel 1996 (9) **G.Villoresi** (dell'Università La Sapienza di Roma);

nel 2000 (10) **J.Ormenyi** (dell'Istituto Meteorologico di Budapest);

nel 2002 (11) **F.Halberg** (dell'Università di Minneapolis del Minnesota, USA) ;

nel 2005 (31) **B.Vladimirsky** (Direttore Osserv.Astronomico di Crimea, Ucraina) e **A.A. Konradov**, Ist.bioch. phys., Moscow, Russia .

Di Halberg , è da citare uno studio di cronobiologia di grande interesse sul rapporto fra infarto miocardico e tempeste magnetiche (18), considerando in tal senso anche gli studi fatti in precedenza da Villoresi (19) insieme a studiosi russi .

E' ben noto ai ricercatori che le variazioni di flusso dei neutroni sono in correlazione negativa con l'attività solare (20, 21) ; cioè i Raggi Cosmici (GCR) aumentano quando l'Attività Solare diminuisce e calano quando essa aumenta .

Considerando che la frequenza delle CSD rispetto all'Attività Solare ha dimostrato un comportamento analogo dando una correlazione negativa, per semplice deduzione, ci si chiedeva se le CSD risultassero correlate positivamente, con i raggi cosmici . In tal senso si è avuta risposta dalla letteratura , comparando variazioni di flusso neutronico registrate come GCR Colorado e a Mosca (21), con le variazioni di frequenza delle CSD [l'A. chiede ai fisici se e quando sarà possibile in tale flusso , distinguere bene la componente solare da quella extra solare] .

Si notò cioè una correlazione positiva tanto evidente, da presumerla significativa pur non ricorrendo alle opportune analisi statistiche . La non casualità (7 -11) delle variazioni di frequenza delle CSD risulta comunque, molto evidente .

I fenomeni bio-fisici prima citati colle loro periodiche variazioni, possono essere paragonati in tutto ai fenomeni fluttuanti che a lungo studiarono Piccardi (22-25) a Firenze, dal 1950 al '72 e la Capel Boute (26-28) a Bruxelles, dal 1956 al 1978. In tali ricerche essi collaborarono a lungo .

E' doveroso ricordare pure Tchijewsky (29, 30) che aveva notato fin dal primo novecento, con indagini lunghe e accurate, che alcune epidemie seguivano un andamento ciclico del tutto analogo al ritmo dell'attività solare attività espressa dalla variazione del numero delle macchie solari.

Malattie infettive come difterite, peste, meningite c.s., tifo, vajolo ed altre ancora, presentavano l'acme epidemico in corrispondenza di quello dell'attività solare.

Secondo l'A. russo l'attività solare avrebbe agito da fattore di vero e proprio < eccitamento biologico > .

Ma egli fu molto contrastato dal mondo accademico .

Per finire Tchijewsky fu allontanato in Siberia da Stalin e solo sotto Kruscev poté rientrare ma morì poco dopo, nel 1964 .

Nel 1965, il considerevole valore scientifico dei suoi studi fu riconosciuto dall'Accademia delle Scienze dell'URSS , grazie all'opera accurata di una commissione allo scopo istituita . Per finire, la figura di Tchijewsky ne uscì riscattata non solo come uomo ma anche come ricercatore .

A questo punto non sarebbe azzardato combinare la vasta esperienza fatta sulle CSD, con quella che fece Tchijewsky con i suoi studi epidemiologici .

Considerando infatti che ad un calo dell'attività solare corrispondono un aumento di flusso dei neutroni e un aumento della frequenza delle CSD, ne deriva che in tale periodo si avrebbe un aumento di cellule modificate nella popolazione batterica .

Poiché alla precedente fase ne segue una che presenta un'innalzamento dell'attività solare questa agirebbe, restando nell'ottica di Tchijewsky , da forza biostimolante e talora sufficiente pure a produrre un'attivazione della popolazione batterica precedentemente arricchita di individualità cellulari modificate. E ciò al punto da poter scatenare quei fenomeni epidemici periodici evidenziati dallo studioso russo .

Un'interpretazione suggestiva questa che con l'ausilio dei dati CSD, confermerebbe quanto fossero state geniali a suo tempo, le intuizioni avute dal Tchijewsky .

Quello qui indicato é un confronto suggestivo, stimolante ma non pretenzioso .La sua estemporaneità infatti, non può farlo trovare fuori luogo se, volendolo considerare, lo si volesse tollerare solo come una delle ipotesi interpretative più interessanti .

La ricerca sarebbe migliore se si perpetuasse in una staffetta di contributi umani in un clima di generale collaborazione e di sereno confronto. Ciò porterebbe, gradino per gradino, ad elevare la conoscenza della nostra realtà con il contributo di tanti , anche dei più umili .

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NOTA :

- A) L'autore ha collaborato alla pubblicazione citata al n°10, svolgendo la parte microbiologica .
- B) I suoi dati giornalieri delle CSD , tabulati dal 1970 al 1991, sono consultabili nel sito internet http://www.cifacef.org/cifa_news.html .
- C) **E' inoltre a disposizione per ogni chiarimento sulle modalità tecniche rispettate nel condurre la ricerca , ivi compresi gli errata corrige che fossero stati attuati [passfahren@tin.it] .**

Short Author's Curriculum

Faraone Piero Adriano Romano, was born in Torino, in October 1931.
He realized his high **studia** with diploma before in Classic Liceum School and after in Milano-Medical University.

Successively he concluded in the same university his studia of Hygiene Speciality and expecially of Microbiology-Laboratory .

He frequented as boarder-student and after as Med. Microbiologist Assistant the Hygiene Institut of Milano University (1956-1961) .

After he was in **Military-Service** as Medical Army Officer (1959-1960) and was Director of Sanit. Service of Distretto Militare of Milano in Army Medical Corp .

He practised medical activity from 1960 to 1961 for the **Société suisse** de secours mutuels **Helvétia** in Canton Ticino, where lived with his parents from 1951) .

After he was Med.Hyg.Microbiol.Assistent in **Hygiene and Profilaxis Labor.** of **Milano** and his Province (1961-1975).

He was also named **Medical-Microbiologist Consultant** of Istituto **G.Pini** , Clinica Ortopedica dell'Università di Milano [from 1974 to 1976] .

He was named **Medic.Director of Hyg.Profilaxis Labor. of Como** and after **Medic . Director in Hygiene and Profilaxis Labor. of Rome** where he preferred his engagement(1976-1991).

During his Rome-engagement, he shared in several studia-committees in collaborating with **Ministero** della Sanità and with **Istituto Superiore della Sanità** .

He was temporarily assigned to **Lombardia-Regione** to collaborating with Public Hygiene Service -Director , from september 1980 to may 1981 .

He is interested also about interdisciplinary studia as researcher, operating too from 1972, in **CIFA** [*Comitè Internat. de Recherche et d' Etude de Facteurs de l'Ambiance. Association Internationale a but scientifique.; Monit. belge,28 Aug. 1968*] before in collaboration with prof. **Gualtierotti R.** of Milan-University (Medical -Bioclimatology Centre) and drs. **Capel Boute** of Buxelles-University (Chemiophysical Institute) and after with dr. **Wedler P.** of Free Berlin University (Meteorology Institute) and prof. **Vladimirsky B.** of Crimean Astrophysical Observatory .

His publications are expecially in collaboration with american and russian authors until today .

He attended directly and more rarely indirectly through his collaborators, to several **National and International Meetings** with lectures, expecially with his experimental studia on bio-environmental correlations, considering particularly cosmic parameters .

The more important of these ones were in :

Como 1971, Ancona 1974, Colle Isarco 1977 and 1979, Fresnes/Paris 1984, Tours 1984, Amsterdam 1989, West Lafayette-USA 1987*, Vienna 1990, Roccaraso(L'Aquila) 1991, Bruxelles 1992, Pushchino (Moscow) 1993, Ljubjiana 1996*, Brno 1999, Roma 2001,Tokyo 2002, Paternit 2003*,Firenze 2004,2005 [he gave indirectly his contribution in meetings so signed*].

He published on these last 40 years, several **papers** (about a hundred) in Italian, in English and sometime in Russian], in scientific journals of hygiene or microbiology, considering particularly studies about bio-physic correlations with microbiological and cosmic parameters, as said before .

It was very interesting his strict collaboration from 1999, for several years with prof. **F.Haberg** [*Director of Cronobiology Centre of Minneapolis University, Minnesota,(USA)*] and his Team ; and he was named Member of International Project on

the BIOSphere and the COSmos(BIocos) for microbiology, in **Halberg Cronobiology Centre** .

He realized also a research with prof. **Konradov A.** [recently died], Head of Math. Modeling group of Emanuel Institute of Biochemical Physics, Russian Academy of Sciences, Moscow, Russia , and with prof. **Vladimirskji** ,of Scientific Research Institute, Crimean Astrophysical Observatory, Crimean University of Ukraine.

He was also membership of Internat. Society of Biometereology from 1990 .

He is named **CIFA VicePresident** in 1992 and is Adviser of **Cifa News Journal** from 2001, in collaborating with **CSOBM**(*Centro Studi Onlus di Bio-Meteorologia in Rome*), **CIFA** (*Comité International de Rescherche ed d'etude de Facteurs de l'Ambiance*) , **SIMA** (*Società Italiana di Meteorologia Applicata*), **TESLA** (*Associaz. Tutela Elett.magnetica e Studio Livelli Ambientali*) and with dr. **Valenzi Vincenzo** , *Coordinator of Centro di Biofisica Clinica dell' Università "La Sapienza" di Roma* .

He had in 1986 the Rewarding Diploma of **Gran Croce for the Public Health** , from International Academia for Economic and Social Science of Rome , via Nazionale 163 . Moreover he was in 1998 cited for his interdisciplinary researches in bio-cosmic correlations, from American Biographical Institute of Raleigh, North Carolina , **USA**, and from International Biographical Centre of Cambridge , **England** .

From 2005 he is Member of **International Academy of Sciences**, Rettore prof. R . Gualtierotti , Head Office / Via G. B. Nazari 2 , 20129 **Milan** , Italy .

Hobbies :

He had a **Sporting Activity** through **FIDAL**, competing in athletics-races from 1949 in Libertas Ascoli [Marche Region], and from 1951 to 1958 in S. G. Comense [Lombardia Region] .

In **Culture-Readings** he loves history, arts and poetry ; in the last one he wrote something but it was never edited.

Main personal peculiarity :

He had the particularity to live successively in **several residences** : Torino, Modane(F), Ventimiglia, Genova, Ascoli Piceno, Morbio Inferiore(CH), Milano, Roma and again Milano . And also these familiar necessities adapted him to have more easy a good disposition to contain other practices and opinions .

Faraone Piero Adriano Romano

“Hydrogen Bond and Informational Coherence”

Understanding and exploiting O..H Hydrogen bond activation in water clusters.

By : Paolo Manzelli LRE@UNIFI.IT General Secretary of CIFA

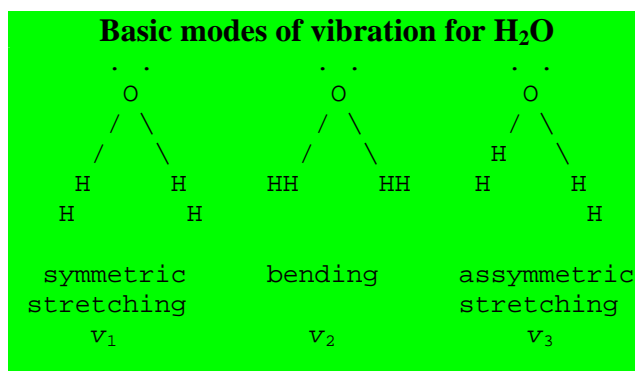
1st Seminary pf COHERENCE 2005 on “Weak interactions and cold nuclear reactions” -Roma 27 May/2005

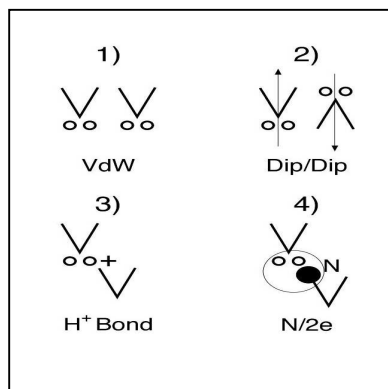
Abstract : Water Clusters are composed by dynamic generation of groups of water molecules co-organised in some coherent micro-drop structures, through the aggregation of different geometrical types and dimensions of bonding approaches as well as , Ionic ,Van der Waals, Dipolar interaction and H-Bond. The H-Bond that will become co-ordinated through a virtual “H-Ph.” pulse generation giving informational coherence. The non linear nature of this complex multi-chemical bonding dynamical networking of water molecules , obtained by rapidly fluctuating and interchanging configurations of coherent micro-drops, explains how the unique properties of water contribute to the occurrence of the phenomena of life.

The importance of influence of the co-organization of water clusters, including hydrogen bonding dynamic creation, is great for all living system . Hence would be promising any tentative of understanding H₂O coherently co-operative clusters dynamic, that can be useful to explain how water can work as a catalytic systems that highlights the potential of bio-chemistry in living matter.

Water can generate a series of intra-molecular interactions responsible of the strange properties of water because the “micro-coherent clustering” can be seen as a resonance cavity of a series of specific low frequency oscillations, generated by the H-Bond dynamic configuration. Resonance’s effect , is able to communicate and transmit frequency ‘s information from one bio-molecule to another in all living water-systems.

The resonance effect occurs when two neighbouring water molecules incorporated in the micro-drops clustering, are moving one against to the other, so that the asymmetric stretching of one Hydrogen strongly interact with the electron pair of the oxygen of another molecule. In these case the effect of a very short range electron repulsion, between electron pair valence shells, and with the one electron of the Hydrogen of other H₂O molecule , interacts in a way that the electrons pair of the oxygen molecule strongly repel the other electron , toward a limit where one nucleus of hydrogen (N^H) remain for a short time uncovered by the electronic orbital. (see following figures)





Caption:

- V = Water Molecules ; (oo) = Electron Pairs ;**
- 1) Van Der Walls Intramolecular Interactions;**
 - 2) Dipole - Dipole multiple interactions ;**
 - 3) (+..oo) = H...Bond interactive forces**
 - 4) N/2e⁻ = Hydrogen Nucleus (N^H) → Phantom Atom (H²⁻⁻) virtual generation.**

In fact the electron repulsion in a first phase is getting the effect of exciting the molecular orbital of the neighbored “hydrated hydrogen” generating the ionization responsible of the ionic H-Bond, while in a second phase the coming on uncovered Nucleus (N^H) will be capable to change drastically the repulsive in attractive behaviour, this because the (N^H) attracts in the opposite direction the pair of electrons on hydrated oxygen of the other water molecule changing the nature of H-Bond interactivity.

Hence tacking a quick look at the double face scenario of interactive dynamics of Hydrogen Bonds generation, it will be possible to can distinguish a competitive reactivity, wherefrom the one hand the repulsion to upper level of quantum jumping that generate the ionization of the H-Bond , and from the other hand the H-Bond pattern will be in antagonism with the (N^H) attractive reaction that works for capturing two unpaired hydrated electrons delocalised near to the oxygen of another water molecules, getting a not illogical probability of new Hydrogen (H²⁻⁻) - virtual generation of a “Phantom Hydrogen Atom” (H.Ph.)

Fluctuation studies on the effects of refraction in non-equilibrium relaxation energy pathways following the rupture of H-Bond and the substitution by the attractive nuclear potential in enhancing reaction cross sections at moderately low energies are very complexes however evidently this interaction implicates too weak forces that are not be able to produce effectively a new (H²⁻⁻) **phantom atom**, but only can be admitted the generation of the virtual (H.Ph.). In any case the virtual production of (H.Ph.) generates a periodical-pulse of energy redistribution into the networking multiple bonds micro-clustering drops of liquid water . Therefore the virtual production of (H.Ph.) virtual Atom it is not outside of physical effects. These “periodical-pulse” effects are embodied in the quantum probability effects coming from quantum tunnelling dynamics.

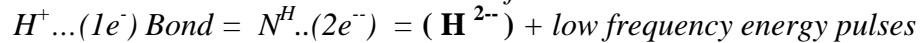
Certainly the oscillating pulse signal within a quantum tunnelling period modulation is non allowed in a simple semi-classical expression of molecular orbital calculations, normally calculated in the context of the Born-Oppenheimer approximation, where is considered only the electrons interaction working in a nuclear constant nuclear potential of fixed nuclei.

As a mater of facts considering the quantum tunnelling effect it will be possible to simulate how much the distance of interaction between water molecules can be variable in a way that the electronic cloud of each water molecule can move forcing repulsion till that it will be no unacceptable the probability that one Hydrogen nucleus (N^H) is becoming out of the cover of the molecular electron cloud, and therefore is possible to understand the effectiveness of very short oscillating timing sparks production in a coherent structure of water micro-drops.

Therefore involving a quantum tunnelling dynamics, in the competition between donor and acceptor of unpaired electrons collocated on the oxygen , it will be possible to understand how much the nuclei of molecular hydrogen involved in H-bond dynamical generation can exist as an uncovered hydrogen nucleus (N^H) and the successive calculated probability indicate the timing effect of “ periodical-pulses” that can happen in 50/ 100 femto-seconds more or less, i.e. than 1/10 millionth of a millionth of a second....more than an order of magnitude faster than any other liquid , so that those consideration

can explain for instance the very high entropy of water observed near to the absolute zero temperature. Knowing the above effects it is possible to imagine the quantum weakening of energy barrier by means opening a continuous tunnelling channel within a short lifetime of existence ; in this case one may expect the before indicated activity based on a double competitive reaction acting in femto-second of timing. ($= 10^{-15}$ Seconds). The oscillating opening of this channel works as well as a “waveguide of informational pulses”, that routinely it is not taken in consideration , although is not be seen as a forbidden virtual transition effectively generating resonance effect of energy pulses during a twining-reaction happening in a open energy and matter system of transformation.

“H-Ph.” Virtual covalent bond of “Phantom H-atom” creation



In conclusion the growing of periodically oscillating relationship among hydrolytic bonded N^H and $2e^-$ unpaired hydrated electrons , produces an catalytic effect of the “intra-molecular condensate matter of water micro-clusters” by the way of the generation of informational pulses sourced in a time spark of phonons during the vibrational regeneration happening in a ultra-fast range of about 50 //100 femto-seconds.

This kind of interstitial H-bond dynamics is quite similar to the periodic activation of some semi-conducting metallic bond quantum channels, (generating in the range of pico-seconds, ($= 10^{-12}$ Seconds) some sparks of free carriers excisions), therefore also this comparison, will ultimately allow to exploit the nature of the strange properties of water and can be useful to understand more efficiently and cleanly the catalytic informational resources of water in bio-chemical systems .

Besides utilising this model we can make use of a time-varying low magnetic field near a flash -back resonance to reinforce the coherent coupling between bonding N^H nucleus and double “insecure and unstable ” unpaired electrons, that normally are delocalised on the oxygen of water molecules. Therefore this effect of tunnelling driven dynamics would be useful in the context of experimental research on “Cold Fusion” , where the incoming cases of success can indicate that will be possible to create a quantum superposition of Phantom atoms in a trapping coherent state of water drop-clusters, determining an chemically assisted nuclear reactions in water environment.

- Certainly an embarrassing situations in this field of interpretation of the pulses effects of H-Bond dynamics in water micro-drops clustering is a consequence of the computational complexity.

In fact although the coherence properties of such condensation H-Bond water’s clustering have not hitherto been probed with complete scientific satisfaction, in any case the prospect of creating a superposition condensation in a dynamic regeneration of bonding nucleus and electronic unpaired in water molecule has also open a new theoretical work that anyway is very difficult due to the complexity of the mathematical interpretation of action occurred between electromagnetic orbits an the complex nucleus structure, that need to work out of side of the Born Oppenheimer approximation; so that because such high complexity till now do not made possible to calculate the rich diversity of interaction in molecular systems between the nuclear forces and electromagnetism in a condensed matter hypothesis.

In spite of this difficulty, molecular H-bond dynamics can be understood not only by an intuitive understanding of the case where need to take in consideration the breaking of the asymmetric electron // nuclei bonding structure, that in our case happen when unpaired electrons can be captured a very short distance by generating a quantum-spectrum of positively charged nucleus.

Any way it is possible to simulate a double reaction antagonist activity studying what affects the equilibrium dynamics coming from “bonded //not bonded” Phantom atoms, virtually created by the interaction of a nuclear hydrated hydrogen and the unpaired electrons of hydrated oxygen on neighbouring water molecules.

Following this mode of reasoning it will made possible define the generation of a “Phantom of Hydrogen Atom” through an instantaneous disjoining of the ordinary divergence of energy symmetry of the four fundamental physical forces.

At closing stages in this short paper we can support and carry on a deeper study that would take in consideration, how the non-linear electromagnetic bonding nucleus (N^H) can interact with two unpaired molecular bonded electrons in the reaction equilibrium between $\langle H_3O^+ \text{ and } OH^- = 2 H_2O \rangle$ in a way that is becoming responsible for both chemical multiple bonding dynamical system $\langle H\text{-Bond} = H.Ph. \rangle$, both generating a phonons sparking information diffused by a semi-closed networking cluster, belonging to coherent structure of micro-activated drops spreading in the water bulk.

The dynamics of such water-clustering into some coherent micro-drops, probably can be organised into a hierarchy based on external multiple bonding interactions, that can be seen as well as a series of Chinese boxes where the Vand Der Waals and Dipole-Dipole interactions are situated at the external dimension of any coherent micro-drop, that contains at the centre the $\langle H\text{-Bond} = H.Ph. \rangle$ interactive dynamics with at the core the (N^H-2e) pulses sparking interaction, generated through the virtual temporary production H-phantom, theoretically achieved by means the application of the uncertainty – tunnelling quantum effect. This complex timing coherent composition of sparking phonon-pulses, experimentally can be seen as an effective effect in the non-periodic reactions (CLOCK-REACTIONS), and also will be useful in future to get a model for exploring the conditions underlying the unification of electro-molecular and nuclear properties that lead to the understanding of catalytic informational development of higher-order molecular living structures.

Thinking in similar way the Prof. Giorgio Piccardi Director of the Chemical Physics Institute of the University of Florence, during the years between (1960-1970) considers some experiments to demonstrate the existence of a clustering mixture of virtual atomic and molecular states, that can be reorganized and probed by forcing by means stimulating the dynamics of growing up of water “micro-drops” through impulsive changes of the low frequency electromagnetic field, hoping in this way to activate a better coherent oscillations in the number of virtual sparking channel, if they effectively can exist in the water micro-drops condensates.

Therefore Prof. Giorgio Piccardi tries to demonstrate the possibility of such water activation (*) (“ACQUA ATTIVATA” see in Italian language the remembrance of Prof. Giuseppe Loglio (Appendix-1.), and also the short abstract (Appendix -2.) about the original works of Professor Piccardi, given by Prof. Maria Grazia Costa, about some methods of water activation experimented in the Chemical Physics Institute of the University of Florence.

Piccardi was thinking to trigger a coherent hierarchy of water clustering favouring the building up of these coherent instantaneous drops facilitating the structuring of a multiple bonding approach containing external weak bonding interactions that close in a series of Chinese boxes the Dipole-Dipole interactions and finally the H..Bond dynamics, that enclose in the core the (N^H-2e) sparking interaction of H-phantom uncertainty generation. At last I would like to remember that speaking personally with Prof. Piccardi some years ago I try to develop the idea that this complex coherent composition of micro-drops in water, because their effects can be seen as an effective result in the non-periodic oscillating reactions, and I try to give an explanation about the conditions underlying the unification of electromagnetism with the nuclear forces has resulted in an anomalous perturbation of the periodicity of orbital properties and lead to the development of higher-order molecular structures. As a matter of fact it is easy to see an experimental evidence of energy pulses effects because they can be seen at work during the Belousov-Zhabotinskii type reaction where giving rise to three-dimensional channel’s waves generated by periodical low frequency pulses



Belousov-Zhabotinskii type reaction giving rise to three-dimensional channel’s waves

Those reactivity's patterns in water solution are central to biochemistry because they result in powerful information catalysts behaviour, that seems generated by timing sparks which can direct the path of the reaction dynamics, since of the generation of local activating sites globally potentiated through the modulation of intermolecular H-hydrogen dynamics of virtual bonding associations.

In any case the Understanding and exploiting Hydrogen bond dynamics activation in water clusters is today a open question, but due to the importance of water clustering in the most biochemical reactions , the described approach and experimentations of activated water made by Giorgio Piccardi with electro-magnetic fields at low and very low frequencies , can be usefully taken in consideration in the next future also starting from these theoretical considerations and personal remembrances.

Appendix 1.

(“ACQUA ATTIVATA” see Italian language the following remembrance of Prof.Giuseppe Loglio , about one method of water activation made by Prof. Giorgio Piccardi)

Prof. Giuseppe Loglio loglio@unifi.it

Department of Organic Chemistry, University of Florence

Descrizione della procedura di "attivazione dell'acqua" come io la vidi compiere dal Prof. Giorgio Piccardi negli anni sessanta.

1.- Descrizione dello "strumento" utilizzato per la attivazione dell'acqua.

Lo strumento era costituito da un palloncino di vetro pyrex, di volume di 100 - 150 centimetri cubi, in cui era stato estratta l'aria con una pompa a vuoto. Il palloncino conteneva una piccola quantita' di gas neon, aggiunto successivamente alla estrazione dell'aria. Dentro il palloncino era stata anche immessa una goccia di mercurio (circa 0.2 centimetri cubi) e infine il collo del palloncino era stato chiuso alla fiamma. Un secondo palloncino, identico al precedente ma senza la goccia di mercurio, era utilizzato come strumento di confronto differenziale.

2.- Procedura di attivazione.

(See also: “ Measurement of noise emission from mercury balls” –Nature Vol.205, Feb.(6),1965)

I due palloncini venivano presi, uno per mano, utilizzando il collo come manico da tenere con le dita. Muovendo i palloncini contemporaneamente con un movimento circolatorio dei polsi, si metteva in rotazione la goccia di mercurio, presente in uno di essi, lungo il diametro maggiore del palloncino. In questa condizione, si osservano lampi di luce all'interno del palloncino con il mercurio, generati dal gas neon per effetto della rotazione della goccia di mercurio sulla superficie del vetro. Nel frattempo, il campione di acqua era stato suddiviso in due aliquote uguali che erano state versate in due larghi recipienti piu' larghi che profondi (due bacinelle). I due palloncini ruotanti venivano lentamente abbassati fino ad immergersi nell'acqua delle bacinelle e il movimento rotatorio veniva continuato per alcuni minuti. Al termine di questa procedura, si confrontava il comportamento dell'acqua della bacinella "agitata con il palloncino con il mercurio" (acqua che veniva denotata come "acqua attivata") con il comportamento dell'acqua dell'altro palloncino (acqua di riferimento o "bianco").

3.- Esperimenti con l'acqua attivata.

Mi fu riferito che l'acqua "attivata" mostrava un comportamento diverso dall'acqua di riferimento quando essa costituiva un sistema in cui erano presenti interfacce, tra due fasi, di superficie molto estesa (ad esempio, cio' si verificava nel processo di precipitazione dell'ossicloruro di bismuto, che a volte veniva accelerata (acqua T), e a volte veniva ritardata ; (acqua R).

Io mi occupavo di altre cose e dunque non ebbi mai occasione di vedere esperimenti con l'acqua attivata.

Una sola cosa misuravi sull'acqua attivata e cioè' la tensione superficiale. Per questa proprietà non osservavi nessuna differenza rispetto all'acqua ordinaria.

Appendix 2.

Remembering that pure water without impurity do not exist in nature , the water activation can be regarding a system of micro-drops that works as well as dielectric interface in chemical and bio-logical systems.

G. Piccardi Publications regarding the “ACQUA ATTIVATA”.

- 1) “Azioni elettrostabili sull’ acqua : sopra un nuovo effetto presentato dai metalli . Archivio di Radioterapia e biofisica (1937 –V) . and also in : Gazzetta Chimica Ital. 1938,68,246)
- 2) “ Sulla Precipitazione dal Carbonato di Calcio da acqua Dura “Attivata” (T , o , R) e normale”. Gazzetta Chim.Ital. 1938,68,287).
- 3) “Sulla Tensione superficiale dell’ acqua attivata (T)” (Gazz. Chim.IT 1938,68,471)
- 4) “Sopra un Nuovo Fenomeno di natura elettrica”. (Rend.Acc.Lincei, 1939 (6),29,84).
- 5) “Effetti chimici e biologici dell’ acqua attivata (T) ed (R) “ , la Chimica e l’ Industria 1939 (a) 21, 455.

Proprieta’ e caratteristiche dell’ Acqua Attivata secondo G. Piccardi .

-
- L’ attivazione in genere permane da 1 a 4 giorni ed e’ capace di comunicarsi attraverso le pareti dei recipienti , anche metallici, od altro liquido posto all’ esterno dei recipienti medesimi ed in contatto con questo: cioè’ presenta proprietà analoghe a quelle del calore. Inoltre si comunica ad altri campioni anche a distanza se l’ esposizione e’ molto lunga , cio’ e confermato anche da altri autori. L’ attivazione quindi non e’ istantanea e raggiunge il massimo dopo qualche tempo ed infine permane con la distillazione del liquido o la cristallizzazione, ed ha quindi il carattere di una proprietà estensiva.

-Effetti dell’ Acqua Attivata secondo G.Piccardi.

- -Utilizzando acqua liquida attivata in confronto contemporaneo ad una porzione delle medesima non attivata si notano variazioni nei seguenti fenomeni:
- -Idrolisi del Cloruro di Bismuto
- Comportamento biologico delle Alghe (deperiscono in acqua attivata)
- Precipitazione (coagulazione) del tri-solfuro di Arsenico Colloidale
- Precipitazione (coagulazione) dei colloidi d’oro
- Disincrostazione delle caldaie
- Polimerizzazione del Nitrile Acrilico
- Fermentazione del lievito di birra
- Potenziale di superficie dell’ acqua
- Peso Molecolare in p.toluidina (crioscopia)
- Sovra-raffreddamento dell’ acqua

- Potenziale di sedimentazione di polvere di quarzo
- pH potenziometrico dell' acqua
- Cristallizzazione della Naftalina daToluolo
- Reazione Biologica di Meinich
- Saggio della cardiolipina
- Pressione superficiale di films di acido palmitico
- Aumento del rendimento delle resine a scambio ionico.
-

Final Note :

The Activate Water was experimented by Professor G.Piccardi as well as a catalyst of growing of Plant's intelligence and sensibility.

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Water Chemistry: <http://www.science.uwaterloo.ca/~cchieh/cact/applychem/waterchem.html>

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Hydrogen Bond Network of Liquid Water:

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Cosmology and chemical-physical rhythms

Giorgio Papeschi, Mariagrazia Costa and Mara Larini

In Piccardi tests, by mixing two components, there is formation of a new phase following processes, which evolve by way of several stages, such as:

- nucleation, growth of the new phase, coagulation, sedimentation, as well as others (1).

In the test developed by the authors, the phase change of a single pure component was followed, and the considered physical process essentially included two stages: nucleation and growth of new phase crystals. Naphthalene was the chosen substance, characterized by a notable undercooling which favoured observation of the moment of sudden phase change (2).

Naphthalene P Test. The investigation method is analogous to all Piccardi tests, i.e. statistical and differential. The same quantity of naphthalene was introduced into 20 glass, flame-sealed vials. Two groups of 10 vials each were immersed in water contained in double-walled glass basins placed in series. In the inter-space between the two containers, water (at 90°C) was circulated until complete fusion of the naphthalene. A cardboard tunnel was placed over the first glass container; a cardboard tunnel covered on the outside with a copper sheet was placed over the second. When the thermostat was turned off, the system cooled down until the naphthalene in the 20 vials began to solidify. The 10 couples of corresponding vials were compared, observing which crystallized first and calculating as percentage (T%) the earlier formation under the copper sheet.

The response of these “naphthalene P test” demonstrates an oscillating trend over time with a 28-day period (=1 lunar month) (3-5).

Figure 1 reports the results of the correlation analysis of the values (T%) from the naphthalene P test, of the coagulations obtained in Florence and the geomagnetic index registered at L’Aquila and all relative to the same approximately two-years period. The characteristic points of the curve are statistically significant.

The correlation index between the naphthalene P test and coagulations is nearly - 1 (Tab. 1). The correlation between naphthalene P test and K_{Aq} improves if the K_{Aq} values are shifted five days later compared to the T% values.

Daily variations of pH of the water. (6-10) Starting from the observation that water samples subjected to shaking in absence or presence of a low-frequency electromagnetic field (11) reached equilibrium at different pH values (Fig. 2), the authors undertook a study to measure, over a 24-h period, the potenziometric pH of water samples subjected to shaking compared to water samples without shaking.

Shaking was carried out using a Pyrex glass shaker, or a shaker with a closed glass tube containing a magnetic bar. In this latter case a U-shaped magnet was placed directly below the beaker and it was either fixed or rotated at a velocity which was different from that of the glass shaker immersed in the water.

- (1) The potenziometric pH of the mechanically-shaken water demonstrated a characteristic and repeatable daily rhythm with a minimum at about 13.00 hours and another less pronounced minimum at about 18.00 hours (Fig. 3 and 4).
- (2) There was a notable effect of the artificial magnetic field on the pH of the water under shaking in the presence of rotating magnets positioned under the beaker with a decisive shift of pH toward alkaline values (Fig. 5).
- (3) During natural magnetic storms, the recording of pH did not present the usual significant points, the daily rhythm was annulled (Fig. 6).

The hypothesis that artificial or natural magnetic fields act on the carbonic/bicarbonic equilibrium existing in a water system which is at equilibrium with the air is proposed.

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Lino Daddi – Accademia Navale Livorno

HYDROGEN MINIATOMS

Some LENR/CF Scientists assert that, in metal-hydrogen systems, p+e fusion, by forming neutrons, may be a precursor of processes capable of producing the many new nuclides observed in several experiments. The basic mechanism would consist in neutron captures and possible subsequent beta decays.

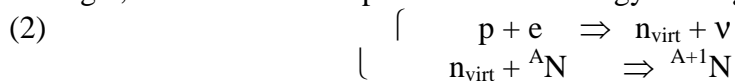
The reaction :



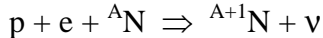
is endoergic, with a 0.78 MeV threshold, but is very improbable: the calculated cross-section is of the order of 10^{-20} barn⁵.

Virtual neutrons

We can consider the possibility of a virtual neutron², that is of an occasional couple in which the electron is very near by the proton with kinetic energy, even less than the threshold of the (1). Near a nucleus it could be captured becoming a real neutron. Indeed neutron capture is almost always strongly exoergic, so it can overcompensate for the energy lacking in the real neutron synthesis:

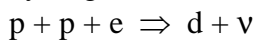


and the total reaction could be :



which also may be written as ${}^A\text{N} (pe, \nu) {}^{A+1}\text{N}$.

The virtual neutron mechanism was also proposed by Dufour, who in particular considered the hydrogen fusion, obtained putting A=1 in Eq.(2) :



or also $p (pe, \nu) d$, the Q-value of which is 1.44 MeV, (equal to the difference between the binding energy of the deuteron and the threshold energy for the neutron synthesis). Dufour admitted that nearly all the energy is carried away by the neutrino, while the deuteron carries only the recoil energy (~ 1 keV).

The virtual neutrons mechanism would be able to explain by itself some cold fusion experiments in which the observed effects can be attributed to neutrons produced by the p+e synthesis, and they seem generated as slow neutrons. But when the total cross-section appears much greater than the expected one, a more complex mechanism has to be identified, like the miniatom formation. In fact, the miniatom formation makes the proton stay very near to the electron for a relatively long time, with a great increase of the probability of the observed reactions that would be determined by the neutron capture cross-sections and by the efficiency of the miniatom formation.

Miniatoms

Some Researchers adopted the hypothesis a proton and an electron can form hydrogen “shrunk atoms” (hydrogen miniatoms), as also a deuteron and an orbital electron can form deuterium miniatoms, with the electron nearer the nucleus compared to the Bohr radius, at new energy levels, even very deep. They could be formed under conditions which aren't the same in the various theories (not all requiring a crystal lattice).

The question of the compatibility of such compression with the uncertainty principle is not always tackled. I don't know if this difficulty may be overcome by the fact that the miniatoms are temporary formations

Very compressed miniatoms should behave as neutrons in crossing the matter; so they could come nearer up the nuclei, with which could undergo absorption processes.

A my paper contains a review of about ten proposals on miniatoms. To them, the theory of Spence should be added: He shown, by a QED calculation, that resonance of long life time (s), nuclear dimensions (fm) and low energy of formation (eV) could exist.

For the hydrogen miniatom Dufour⁷ adopted the name of "hydrex", whereas Mills¹² adopted the name of "hydrino". A quarrel on the priority may be found in Infinite Energy. Among the theories on miniatoms we can quote those of Mills¹³ and Conte¹⁶.

Hydrogen miniatom capture

If a neutron is not formed before, on the target nucleus the proton of the miniatom could be captured by the nucleus (proton capture, or cold fusion by tunneling). The process is generally exoergic; indeed it was considered by various Authors also as possible energy producer. The formed nucleus (intermediate nucleus) so is characterized by (Z+1,A+1) numbers; it should be of stable type, but now it is in an excited state. The most simple case, that now we consider, is when the proton capture is followed neither by emission of some particle (that should take a part of the energy, so subtracting it to nucleus and to the following reaction) nor by fission. Vysotskii reported at ICCF9 the observation of the proton capture $p + {}^{133}\text{Cs} = {}^{134}\text{Ba}$ inside particular biologic cultures.

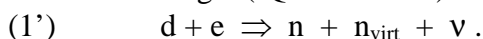
Alkali-hydrogen reactions, were observed by Bush starting from 1992. In electrolysis of potassium carbonate in light water, nuclei of H and ³⁹K pile up at the Ni cathode: a ⁴⁰Ca production is observed.

Shortly after the proton capture, the electron of miniatom could be captured by the excited nucleus, as modified by the preceding absorption. This second part of the process (electronic capture by the intermediate nucleus) would be generally endoergic, but it can come true by utilizing the left over energy from the previous reaction.

The final nucleus, after the twofold capture (miniatom capture), is characterized by (Z,A+1) numbers, as if a neutron were absorbed with (n,γ) reaction, but the our (pe, γ) process is quite different, and the neutron cross-sections don't are valid. The resultant energy of twofold capture (pe,γ) is positive, but it is less than gamma energy of neutron capture (n,γ); indeed now the energy deficit of the proton-electron pair must be balanced.

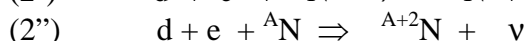
Deuterium miniatom capture

The miniatoms hypothesis can be applied to the deuteron-electron reaction; in this case the electron capture is still more endoergic ($Q \cong -3.1 \text{ MeV}$):



To an initial proposition of Hagelstein it was very easy to confute that, also discounting the very small value of the probability of this electron capture, the virtual neutrons are "of shell" by a few MeV (so their range cannot be greater than a few tens of Fermis).

If the deuterium miniatom encounters a nucleus of mass number A, the total reaction may be :

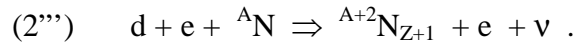


We remind the transition from ³⁹K to ⁴¹K observed by Ohmori. After the deuteron capture (that forms ⁴¹Ca) the electron capture happens also spontaneously, being the mass balance (lightly) positive. This means the transition towards ⁴¹K either happens at the miniatom arrival or will follow by orbital capture (when the nucleus will be in the fundamental state, with half-life of $2 \cdot 10^5 \text{ y}$).

The double event "miniatom formation" and "compound nucleus formation" could justify the essential features of the Kamada experiment where, instead of the (n,γ) reaction, it could occur

a reaction of the (n, α) type with $Q > 0.78$ MeV with nuclides present (also in small quantity) in Al or in CR-39. The random direction of the charged particles suggests that the neutron source was different from the narrow zone of the electrons incidence.

If the alone deuteron is captured, the (2') is replaced by :



An example : Vysotskii, with biologic cultures in heavy water, observed the $d + {}^{55}\text{Mn} = {}^{57}\text{Fe}$ reaction, with rate of 10^{10} nuclei/s.

Muonic and Widom miniatoms

In past time the muonic miniatoms were studied, in which the orbital electron was replaced by a muon. Being its mass 200 times the electron mass, the muonic atom has a radius 200 times less than normal hydrogen atom. The consequent increase of the tunnel effect probability cannot have a practical utilization being too short (about a microsecond) the muon life.

According to Windom, the electron mass in condensed matter can be modified by local electromagnetic field fluctuations; the mass growth in the theory appears in a classic treatise on quantum electrodynamics. The collective motions of the surface protons produce suitable oscillating electric fields which renormalize the electron self energy. In palladium the electron mass enhancement is 20.6, decidedly above the required minimum value of 2.531 for the (p+lepton) reaction.

Surface protons can capture a heavy electron producing an ultra low momentum neutron plus a neutrino, as in (1). This production can induce chains of nuclear reactions in neighboring condensed matter, according to the results of Iwamura

One seeks to have nearly pure hydrogen isotopes as an easy support of the required coherent collective oscillations. However the transmutations could alter the initial purity.

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