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Editorial

Whilst the Italian Piccardi School activities is subjected to a arrest for a little while and the CIFA NEWS managements present its limitations linked to economics, management and linguistic difficulties surprisingly "Le Scienze", the Italian edition of "The Scientific American", dedicates a strong attack against Piccardi after more then thirty years from his death.

It could be very interesting to understand the reasons of such a drop of style of the authoritative and very well known scientific magazine. Actually, after having recognized a first order scientific curriculum to Piccardi, "Le Scienze" assert a presumed fantastic decadence of the Piccardi along the last 20 years of his life. A first opposition to this tentative of after death Piccardi denigration comes up from Florentine Piccardi pupils, with an article published on the August number of "Le Scienze" against the precedent article written by Silvano Fuso on May 2003.

The overall Piccardi works has been written again by Piero Faraone, a rigorous milanese medical doctor and manager for a period of 20 years of time, of the Rome and Milan Hygienic and Prophylaxis Laboratories.

CIFA NEWS present herewith enclosed the last results of the Piero Faraone as well as his dossier dedicated to Piccardi plus an article written by Boris Vladrimiski, one of the most authoritative astrophysicist of our time, and another article written by Flavio Fontana and Norma Ridi belonging to the "Centro di Ricerca Avanzata dei Pirelli Labs", to re-evaluate the work of Giorgio Piccardi from scientific and industrial point of view. We do turn out these articles for appropriate knowledge of the Scientific and the Editorial Committee of "Le Scienze" Magazine. They assert and inform that, perhaps, Piccardi has not been a "victim" of self deceit that pushed him to believe in phenomenon that exist only in his mind, as it has been concluded by Silvano Fuso very superficially in his article appeared in the improper log book "L'altra Scienza" of "Le Scienze". The objective denigrating content of that statement appears clearly to the average reader and it should be also very clear to the Scientific and Editorial Committee of the "Le Scienze". These statements and considerations inform that, at our age, there is still a way to make science founding it much more on truth research and power willingness of some groups that still now consider the science just a power, such as the church one, to be defended with any means from the "heretic" attacks. It could be inferred that the "Galilei deal" has not taught anything at all on the scientific method and on rigour that should inspire the so-called Science Priests.

However, the instrumental disputes are not constructive so it is better that the steak comes back to the theoretical and experimental conflict that in the modern age have only and only the last word as the Galilei vicissitude taught. Due to these reasons, CIFA News requested a memory note on the subject written by Yury Gurfinkel belonging to the Emergency Department of the Moscow Hospital on his studies on the influences of solar magnetic storm on the cardiovascular apparatus. Furthermore, there are also published the results of Settimio Grimaldi belonging to the CNR, Rome, including a large bibliography on the effects of electromagnetic fields on the cellular evolution. As far as concerning the theoretical aspects of the dispute, it is published a communication of E. Mudretskaya and A. V Nedospasov that tries to build up a theoretic approach on the many interaction among very weak electromagnetic fields and biologic systems.

Those are only some few rows tackling the arguments, but it is accrued to give much more information on the Internet site, on some reviews and on the acts of the International Cosmos and Biosphere Conference organized by CIFA in Crimea at the end of this year.

web-site of conference

http://www.science-center.net/index.php?m=0051&i=1&n=conf_0309281004e

This conference a scientific event which had rebuilt the spirit of the "science for science" and of "men for men". By side of the Conference it has been signed a Preliminary Agreement of scientific cooperation between the Italian Scientific Group, represented by the undersigned, and the Crimea Astrophysics Observatory represented by Boris Vladrimiski, Kiev National University presented by Yury Gorgo, Institute of Biochemical Physics of RAS represented by Alexander Konradov, Russian State Hydrometeorological University represented by Marina Turbina.

"We agree to develop a cooperation in investigation on electromagnetic, radioactive and chemical pollution of environment and their impact on health. Our goal is to join efforts in studying mechanism of action of pollution control for better protection of health and quality of life."

The Scanzano Ionico and/or other sites affair (radioactive, electromagnetic, chemical, ecc.) inform that science have to make its own work to clarify and solve the many problems placed by the last after war industrial revolution along a line of research and development that will project our society and its industries, its governments toward lighted politics that link together development and safety for the men life. Inside this paramount, the new meeting between European East and West in the beautiful Crimea is a real good viaticum for the brand new release of the scientific research placed by the new frontiers.

The Cecil Premium of the 104th Congress of the Italian Society of Internal Medicine has been assigned to the Poster to the contribute of the "SEP (Skin Electric Parameters) in the studies of the meteoropathies".

This big result highlights the fact that science has no limits and scientists must have no fear to approach new, difficult arguments normally consider unknowledgeable and consequently inexistent to many people.

As far as our approach is concerned, we will continue to make our part in the scientific world, well acknowledged of our limits, and of our science and knowledge, plus of our duties of thinking without any kind of dogma, with the necessary rigour to contribute to major knowledge on the Nature.

Vincenzo Valenzi

Editoriale

Nel mentre le attività della Scuola di Piccardi in Italia arrancano e la nuova gestione del CIFA NEWS presenta i suoi limiti collegati a difficoltà economiche, gestionali e linguistiche, in modo sorprendente l'edizione italiana di Scientific American, "Le Scienze", dedica un attacco ad alzo zero contro il Piccardi ad oltre trent'anni della sua scomparsa. Sarebbe interessante capire le ragioni di una caduta di stile così grave da parte dell'autorevole rivista scientifica, che riconoscendo il curriculum scientifico di prim'ordine del Piccardi, con grande leggerezza denuncia una presunta deriva fantastica del Piccardi negli ultimi 20 anni della sua vita. Una prima risposta a questo tentativo di denigrazione postuma viene dai discepoli fiorentini del Piccardi, pubblicata nel numero di agosto delle Scienze, senza ulteriori valutazioni sull'articolo del Silvano Fuso di Maggio 2003 sulle Scienze sul Piccardi.

Il tutto è stato riscritto è commentato da Piero Faraone, un rigoroso Medico milanese direttore per oltre 20 anni dei Laboratori di Igiene e profilassi di Roma e Milano fino ai primi anni 90. Abbiamo voluto riproporre gli ultimi risultati del Faraone e il dossier da lui preparato assieme due articoli, il primo di Boris Vladrimiski, uno dei più autorevoli astrofisici del nostro tempo, l'altro di Flavio Fontana e Norma Ridi del Centro di Ricerca Avanzata dei Pirelli Labs, che rivalutano dal punto di vista scientifico e industriale l'opera di Giorgio Piccardi. Questi articoli che giriamo per opportuna conoscenza al comitato scientifico ed editoriale della Rivista "Le Scienze", ci informano

che il Piccardi forse non è "stato vittima di un autoinganno, che lo spinse a credere in fenomeni che esistevano solo nella sua mente" come, con grande leggerezza, ha concluso (il suo scritto) Silvano Fuso nell'articolo pubblicato sotto la rubrica dall'improprio titolo "l'altra scienza". Il contenuto oggettivamente denigratorio di tale asserzione non sfugge al lettore medio, e non dovrebbe sfuggire neanche al comitato scientifico ed editoriale della rivista. Esso ci informa sul persistere di un modo di fare scienza nel nostro tempo, fondato spesso, più che sulla ricerca della verità, su pretese egemoniche da parte di alcuni gruppi che ancora oggi considerano la scienza un potere quasi chiesastico da difendere con ogni mezzo dall'attacco degli "eretici" (sembra infatti che la vicenda di Galilei non abbia insegnato molto sul metodo razionale e sul rigore che dovrebbe ispirare i cosiddetti sacerdoti della scienza).

Ma le polemiche strumentali lasciano il tempo che trovano ed è bene che la parola torni al conflitto teorico ed alle evidenze sperimentali che nel mondo moderno hanno l'ultima parola come la stessa vicenda di Galilei ci ha insegnato. Per queste ragioni abbiamo chiesto una nota a Yury Gurfinkeld del Dipartimento di Emergenza dell'Ospedale di Mosca sui suoi studi sull'influenza delle tempeste magnetiche solari sull'apparato cardiovascolare, e pubblichiamo i risultati di Settimio Grimaldi del CNR di Roma con una vasta bibliografia sugli effetti di campi elettromagnetici sull'evoluzione cellulare. A proposito di teorie riproponiamo una comunicazione di E. Mudretskaya e A. V Nedospasov sull'Eleptino che tentano un approccio teorico alle molte interazioni tra debolissimi campi elettromagnetici ed i sistemi biologici. Poche righe, ma contiamo di darne conto sul sito e su altre riviste, sulla Conferenza internazionale Cosmos and Biosphere organizzata dal CIFA in Crimea a fine settembre di quest'anno, che è stato uno di quegli eventi scientifici che ci riconciliano con lo spirito della scienza per la scienza, dell'uomo per l'uomo. web-site of conference http://www.science-center.net/index.php?m=0051&i=1&n=conf_0309281004e

A margine della conferenza è stato siglato un Preliminary agreement of scientific cooperation tra il Gruppo Scientifico Italiano rappresentato da chi scrive, l'Osservatorio Astrofisico della Crimea, presented by Boris Vladimiski, Kiev National University rappresentata da Yury Gorgo, Institute of Biochemical Physics dell'Accademia delle Scienze Russa rappresentata da Alexander Konradov Russian, la State Hydrometeorological University rappresentata da Marina Turbina. *"We agree to develop a cooperation in investigation on electromagnetic, radioactive and chemical pollution of environment and their impact on health. Our goal is to join efforts in studying mechanism of action of pollution control for better protection of health and quality of life."*

Quanto accaduto a Scanzano ionico ed altrove (radioattività, campi elettromagnetici, ecc) ci informa che la scienza deve fare il suo lavoro per chiarire e risolvere i molti problemi posti dalla prima rivoluzione industriale, in una azione di ricerca e sviluppo che proietti la nostra società, le sue industrie i suoi governi, a politiche illuminate che coniughino sviluppo e sicurezza per la vita dell'uomo. Il rinnovato incontro tra est ed ovest europeo nella splendida Crimea, è un buon viatico per il rilancio della ricerca scientifica nelle frontiere avanzate. Il Premio Cecil al 104° congresso della Società Italiana di Medicina Interna al Poster su "Il contributo dei SEP (Skin Electric Parameters) nello studio delle meteoropatie", ci informa che la scienza non ha confini e che non dobbiamo temere di sporcarci le mani con temi nuovi, difficili o peggio considerati incomprensibili e perciò inesistenti dai più.

Per quanto ci riguarda, continueremo come sempre a fare la nostra parte nel mondo scientifico, consci dei nostri limiti, del nostro non sapere, oltre che del nostro dovere di pensare senza complessi dogmatici, con tutto il rigore necessario per contribuire a maggiori conoscenze sulla natura.

Vincenzo Valenzi

Egregio Dottor Valenzi,

ho il piacere di comunicarLe che nel mese di febbraio 2004 riceverà il *Trattato di Medicina Interna – Cecil XXII edizione* quale premio per l'abstract dal titolo "Contributo dei SEP nello studio delle metereopatie", presentato al 104° Congresso Nazionale.

La prego di inviarmi l'indirizzo postale al quale il volume dovrà essere spedito.

Congratulazioni, cordiali saluti

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Contribution SEP (Skin Electric Parameters) in the study of the meteoropathies

V.I. Valenzi, G. Monaco, B. Messina, S. Palmieri, S. Spada, P. Cimaglia, L. Petraccia, M. Grassi.

Microclimate modifications could influence meteo pathological frames concerning a high number of subjects according to some statistics quoting that the 25% of people demonstrate peculiar interest to the articular, respiratory and digestive pathologies.

Even due to the new measurement techniques of electric atmospheric and environmental phenomenon inter relationship with electric cutaneous parameters, nowadays the cross correlation among the variations of the meteo climatic parameters and the modifications of respiratory and rheumatic clinical frames begin to be much more clear and understandable. In recent analysis and studies, it has been proved a statistical significant cross correlation between perturbed meteorological conditions and the increasing of bad painful symptomatology and of the dyspnoea.

As far as concerning the mechanisms of correlation between the meteoroclimatic variations and the human pathology, it has been associated the causes to dynamic mechanisms linked to variations of environmental factors such as atmospheric pressure, temperature, humidity and, more recently, the air ionising with peculiar reference to the intense variations of electric atmosphere field and of the concentration of positive and negative ions contemporarily to storming perturbations.

It has been observed that there is a correspondence between the reduction of human body surface electric currents, the cutaneous electric resistance rise (40 KOhm average value) measured by means of an electro cutaneous Skin Electric Parameters (SEP) measurement instrument and the lowering of the atmospheric pressure and the diminution of solar radiation as measured at meteorological observatories at different days of the years.

The measurement of the SEP can, nowadays, constitute a reasonable good instrument for clinical control of chronic meteo sensible pathologies, peculiarly, of articular, respiratory and digestive types.

About these themes we organized a seminary (4-11 dember 2003) for the presentation of the state of art of metereopathies and the discussion of the implications of the SEP study in the anatomophysiology, physiopathology, biochemistry and bio physics. For these reasons the Seminary will the occasion for executing a interdisciplinary Brain Storming to which will participate scientists, researches, managers belonging to various science disciplines that, after some preliminary, introductive and short memories, will discuss among all the participants the various theoretical and practical aspects of the study of the metereopathies.

INFLUENCE OF GEOMAGNETIC DISTURBANCES ON COAGULATION, RHEOLOGICAL PROPERTIES OF BLOOD AND PARAMETERS OF 24-HOURS ELECTROCARDIOGRAM IN PATIENTS SUFFERING FROM CORONARY ARTERY DISEASE

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For today in many cases remains not clear, that is the initiating moment for realizing latent coronary artery disease (CAD) to an acute coronary syndrome.

The purpose of research: to carry out simultaneous studying of geomagnetic disturbances influence on the state of health, on cardiac rhythm and ischemia, and also upon the parameters reflecting coagulation and rheological properties of blood.

Patients and methods. 7 healthy volunteers (mean age $31,4 \pm 7$) and 32 patients with CAD, made two group are surveyed. The first group included 22 patients with a stable angina (mean age $53 \pm 6,8$ years). The second group included 10 patients (mean middle age $62,8 \pm 11$ years) with history of myocardial infarction within 2 months. During 2 weeks each of subjects daily estimated own physical, emotional and intellectual condition on a five-point scale.

We carried out measurement of microcirculation parameters using noninvasive television capillaroscopy daily about 13.00 after 15-20 minutes of rest position sitting at constant temperature in 21-23 degrees centigrade. Recordings of ECG for 24 hours performed with "Oxford" (England) at least 2 times: in a day of quiet geomagnetic conditions and in a day with active geomagnetic conditions. Platelets aggregation carried out using aggregometers "TROMLITE" (Russia) and "CHRONOLOG" (USA). Graphic registration of a blood clot formation and change of its durability in time *in vitro* also carried out.

Results. Obtained results of healthy volunteers show the influence of geomagnetic disturbances manifested in some deterioration of psychophysiological state, rheological properties of blood in microcirculation system, moderate increasing of heart rhythm disorders. Additional techniques as a platelets aggregation and graphic registration of a blood clot formation also confirmed reaction healthy volunteers on geomagnetic disturbances.

Comparing results obtained by all techniques demonstrate that pathological changes in patients suffering with CAD are much higher, than in healthy volunteers. The most significant changes obtained in patients with history of recent myocardial infarction.

A panoramic vision of CSD data collected through 21 years (1970-1991)* in more than four millions of bacterial colonies.

Dr. Faraone Piero A.R., Vice-President of CIFA

ABSTRACT (In Proceedings of International conference Cosmos and Biosphere 26/9-3/10 2003)

The CSD study (CSD = "Colonie a uno o più Settori Differenziati", in English: "Colonies with one or more Differentiated Sectors") consisted of two phases: the experimental observations of the first phase (1970-1983) were performed on colonies of air microorganisms, and the second phase (1984-1991) on colonies of laboratory broth cultures of *S.Aureus* pure populations .

The external cosmic factors influencing the CSD formation, were so dominant that were not concealed by interference with any other possible factors affecting biological substrate.

CSD developed significantly after possible thermo-incubation not only in cultural plates exposed to air bacteria, but also in cultural plates already streaked with laboratory strains of *S.Aureus* broth-cultures.

It was very exciting to see the correspondence of CSD frequency data in these two phases of experiment, especially well emphasized by yearly means values; and this pattern was evident regardless of the different origin of microorganisms studied: on one side from air suspensions and on another side from laboratory broth-cultures. The air microorganisms were miscellany of microorganisms in air free sedimentation with undetermined time suspension and altitude, and at the same time exposed to all environmental factors. The *S.Aureus* cultures on the contrary were pure populations always grown in laboratory-controlled conditions.

After completion of first phase a hypothesis was suggested, that microbiological substrate was under influence of cosmic external factors, which may increase number of cultures with CSD. As a result, the goal of the second phase of CSD study was to show that the physical factors influencing development of CSD in biological substrate were able to pass through variety of artificial shields. The results obtained confirmed this possibility.

The conclusion was that the concordant results of these two phases may not be separated, and only together they represent the whole CSD-research in its possible scientific meaning.

Several investigators statistically studied the CSD data obtained by A., and demonstrated significant correlations with several cosmic factors, such as Solar Activity, Geomagnetic Activity and Magnetic Storms, and also Low Frequency Electromagnetic Waves . Among them were M. De Meyer from Astr.Observ.of Liegi, G. Villoresi and coll. from Rome University La Sapienza, J. O'rmenyi from Meteorol.Institute of Budapest, and recently, F. Halberg and coll. From Minneapolis University.

In common there was found a strong negative correlation between yearly mean values of CSD frequency and Wolf Numbers (WN). It was noted also some delay in extremums : maximum of CSD curve comes out at the period when WN start increasing after minimum, and minimum of CSD corresponds to the beginning of WN decline after maximum.

It was clearly noted a shifting of frequency curve of CSD data, on delaying in comparison with curve of Solar Activity (WN), especially evident in yearly curves data. This is not so easy to explain.

In A.'s opinion as a bacteriologist, is that if the physical factors activity may modify cell bacteria (Modify-Activity, shortly MA) causing mutations and CSD (i.e. radiant factors), and additionally very likely there is also a bactericide activity (Bactericide Activity, BA) preventing many bacteria cells to be cultured.

The A.'s hypothesis considers the BA initially predominant over MA and the BA maximum corresponding exactly (without any delay) to the minimum of solar activity ; and its minimum to the maximum of solar activity. Only in a second instance (and then with some retard), the MA starts prevailing over BA, step-by-step giving always more CSD development. Concluding, when solar activity is higher or lower, on the contrary BA and MA are lower or higher but BA is always in advance compared with MA .

As Van Allen stated, Galactic Cosmic Rays (GCR) are increasing when Solar Activity is declining and vice versa. Considering negative correlation of CSD curve with Solar Activity, and CSD positively correlated with GCR , we should ask physicists, might the GCR serve as a factor affecting CSD, or could it be connected to such a factor? Recently a study was published (2003), showing that bacteria mutations are increasing in space, causing problems of higher bacteria pathogenicity and as a result higher risks for human health. It is interesting to note that experiments in November 1990 performed by author near Rome, showed that CSD frequency increases with altitude comparing to CSD observed at sea level. Considering at last, that the CSD biorythmical incidence at sea level is influenced by external factors, to which people adapted themselves for a long time, it may be very interesting to study CSD in space conditions as a model biological system.

* The experimental study was completed in 1970-1975 at Hygiene-Prophylaxis Laboratory of Milan and Province and in 1976-1991 at Hygiene and Prophylaxis Laboratory of Rome and Province (later named Prevention-Presidium Multizonale of Rome and Prov.).

Extremely low frequencies (ELF) electromagnetic field exposure induces differentiation on human cells

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In the last 20 years, reports of biological effects of low-energy EMF have been increasing (Adey, 1981; Adey et al., 1984; Adey, 1993; Pilla et al., 1994; Hinsenkamp et al., 1997; Zhadin et al., 2001). Particularly debated is the question of the epidemiological evidence (Savitz et al., 1997) of adverse effects of an extremely low frequency magnetic field (ELF) generated by 50-60 Hz high voltage power transmission lines, video display terminals, electric blankets and other home appliances, which raise the possibility of deleterious health effects (Adey, 1981) from exposure to radio frequency (Tenforde, 1995) or low frequency fields (Savitz et al., 1987). A valid objection is that field intensity is many orders of magnitude below the noise threshold so that selective, cooperative, or amplifying mechanisms must be postulated (Weaver et al., 1990). There are also problems of reproducibility of reported effects. The therapeutic potential of ELF can be seen in the proven efficacy of low-energy pulsed magnetic fields in non-union bone fracture healing (Basset, 1993), confirming that under certain conditions non-ionising electromagnetic energy can influence physiological processes in organisms (Basset, 1993). Physiological paradigms for ELF effects are required. Clues may be found in the mechanisms by which ELF interacts with cultured cells under controlled laboratory conditions and by correlating in vivo evidence with in vitro data (Glaser, 1992). Low frequency magnetic fields at 50 or 60 Hz are also reported to stimulate nerve regeneration (Rusovan et al., 1992) or alter gene transcription (Phillips et al., 1992). They may also play a synergistic role in cellular processes that are already activated, such as cell proliferation (Walleczek, 1992). The role of Ca^{2+} in the transduction of these effects has been suggested, and indirect evidence of its involvement has been shown (Walleczek, 1992; Karabakhtsian et al., 1994).

In our work we analysed the effect of ELF on a primary normal human oral epithelial cell line (HOK). Epithelial cells are an interesting model to study the biological effect of the interaction with non-ionising radiations, are not shielded by any other stratum of cells in the impact with electromagnetic radiation, and so they are totally available to the field.

Primary human keratinocytes (HOK) cells are also a very good model to investigate the epithelial switch between proliferation and differentiation (Medema et al., 1994).

The effect of ELF exposure on HOK cells resulted in both a decrease in cells proliferation and a reduction of clonogenic capacity. As compared to control unexposed cells, 96 hours exposure to the field caused HOK cells to grow at lower values. It is reported that electromagnetic field exposure can affect keratinocyte proliferation (Szabo et al., 2001). In addition, the present study demonstrates that under conditions of ELF exposure, HOK cell differentiation is associated with a decrease of proliferation and clonogenic capacity. On the other hand, experiments performed on HOK extracted DNA, in control and exposed cells, revealed that there is not DNA fragmentation in the exposed cells, thus suggesting that the decrease in cellular growth is not due to an apoptosis related process. This was also confirmed by SEM images in which apoptotic bodies were never disclosed. In addition, Trypan Blue dye exclusion data, demonstrated that the percentage of dead cells is the same in control and exposed HOK cells, and that, as a consequence, the decrease of cell number shown in Figure 1 is not due to cell death, but it is due to a slow-down in the growth rate. By ultra microscopy, at 72 hours, exposed cells showed a modified morphological aspect: they are bigger and more elongated than controls. Exposed cells lost filopodia, and show a higher number of lamellipodia, specialized structures for cell-cell contact. The augment of cell-cell contact junctions, is also supported by the increase in expression in β -catenin.

β -catenin is a protein implicated in cell-cell adhesion, binding cytoplasmic domain of cadherin, and in signal transduction (Vasioukin et al., 2001).

β -catenin in 72 hours exposed cells is clearly more dense in spots around the cytoplasm, while in non exposed cells is just visible, distributed throughout the whole cell body.

Cell adhesion molecules and their association with actin cytoskeleton play an important role not only in the maintenance of tissue integrity, but also in proliferation and differentiation (Vasioukin et al., 2001).

Exposure to the field also causes rearranging of actin filaments, leading to an increase in actin expression and in formation of stress fibres that cross parallel to the elongated cells.

Since modification of cellular growth rate and gap junction number with the consequent cytoskeleton rearrangement are implicated in cell transformation (Hsu et al., 2000) we analysed the expression of involucrin as a differentiation marker of keratinocytes (Batta et al., 2000). In human epidermis, involucrin is first observed in the cytoplasm of spinous and granular layer cells. In transition cells, it is equally distributed between the cytoplasm and the nascent corneified envelope, while in the corneocytes it is largely corneified envelope associated. In our experiments involucrin expression in the exposed cells, is increased compared to control. This observation may suggest that the exposed cells are at an upper differentiation level than controls, also confirmed by the increase in cell-cell adhesion and by the decrease in cellular growth rate found in exposed samples.

These interpretations also agree with data about the decrease of expression of EGF receptor. The EGF receptor plays a central role in many aspects of keratinocytes biology (Peus et al., 1997). In normal epidermis the EGF receptor is important for autocrine growth of this renewing tissue, suppression of terminal differentiation, promotion of cell survival, and regulation of cell migration during epidermal morphogenesis and wound healing (Peus et al., 1997). We report a decrease of expression of EGF receptor in 50 Hz, 2 mT, 72 hours exposed cells, compared to controls. These data confirm that 50 Hz 2 mT electromagnetic field, carries human keratinocytes to an upper differentiation level. This is a very important point suggesting a possible application of ELF in the therapy of skin proliferative diseases, particularly for diseases in which there is an activation of EGF receptor, as psoriasis, where EGF receptor is over expressed in all nucleated strata of epidermis (Jost et al., 2000), or in hyperplasia, hyperkeratosis, papilloma, and squamous cell carcinomas (Dominey et al., 1993; Jost et al., 2000).

EGF receptor is involved in development of skin neoplasia (Jost et al., 2000), recently (Solomon et al., 2003) showed that in A431 squamous carcinoma cell line a reduction of EGF receptor expression (EGFr) is related to a decrease in tumor angiogenesis; since in our model we demonstrate after EMF irradiation an impairment in EGF receptor expression this suggest that it might be possible to use non ionising radiations to reduce tumor angiogenesis in skin disorders such as hyperplasia, papilloma, squamous cell carcinomas.

The possibility to use electromagnetic non ionising radiation for clinical aims as non invasive therapeutic agent has just reported by others. (Basset, 1993; Pletnev, 2000; Leszczynski et al., 2001).

On the other hand, it is also to be considered that the differentiative effect due to EMF exposure on normal epithelial tissues, could represent a cause of tissue premature senescence, as the effect found for ultraviolet radiation (John et al., 2001; Fukunaga et al., 2001). Moreover, while UV radiation is shielded also by clothes worn, 50 Hz electromagnetic radiation penetrates into garments and, at the moment, it's not possible to be shielded.

In conclusion, electromagnetic field induces an alteration of growth and differentiation pattern on HOK cells, through a decrease of EGF receptor expression. The modification of morphology, cytoskeletal arrangement, and expression of adhesion and differentiation markers demonstrate that exposed cells are at an upper differentiation level.

If EMF could be used, as a therapeutical tool, to fight epithelial proliferation diseases, it will be investigate in further studies, at the present we demonstrate that healthy epithelial tissues chronically exposed to EMF could undergoes to premature senescence.

REFERENCES

- Adey, WR. 1981. Tissue interaction with non-ionizing electromagnetic field. *Physiological Review* 61: 435-514.
- Adey WR, Lawrence AF. 1984. Non linear electrodynamics in biological systems. In: Adey and Lawrence (eds). New York: Plenum.
- Adey WR. 1993. Biological effects of electromagnetic fields. *J Cell Biochem* 51(4): 410-416.
- Barnes PS. 1996. Effect of electromagnetic field on the rate of chemical reactions. *Biophysics* 41: 801-80,.
- Basset CAL. 1993. Beneficial effects of electromagnetic fields. *Journal of Cellular Biochemistry* 51: 387-393.
- Batta K, Rugg EL, Wilson NJ, West N, Goodyear H, Lane EB, Gratian M, Dopping-Hepenstal P, Moss C, Eady RA. 2000. A keratin 14 'knockout' mutation in recessive epidermolysis bullosa simplex resulting in less severe disease. *Br J Dermatol* 143(3): 621-627.
- Blank M, Findl E. 1987. Mechanistic approaches to interactions of electromagnetic field with living systems. B. Plenum, New York.
- Bellomo G, Mirabelli F, Vairetti M, Iosi F, Malori W. 1990. Cytoskeleton as a target in menadione-induced oxidative stress in cultured mammalian cells. In *Biochemical and Immunocytochemical features*. *J Cell Physiol* 143 : 118-128.
- Chiabrera A, Nicolini C, Schwan P. 1985. Interactions between electromagnetic fields and cells. Chiabrera eds, Plenum, New York,.
- Chute FS, Vermeulen, FE. 1981. In: *IEEE Trans. Ed.* 24: p 278-283.
- Foster KR and Schwan H. 1995. Dielectric properties of tissues. In : Polk, C. and Postow E. (Eds.) *Handbook of Biological Effects of Electromagnetic Fields*, 2nd Ed., CRC Press, Boca Raton, FL, pp.27-96.
- Dominey AM, Wang, XJ, King L jr, Nanney, LB, Gagne TA, Sellheyer H, Bundman DS, Longley MA, Rothnangel JA, Greenhalg DA. 1993. Targeted over expression of transforming growth factor alpha in the epidermis of transgenic mice elicits hyperplasia, hyperkeratosis, and spontaneous, squamous papillomas. *Cell Growth Differ* 4: 1071-1082.
- Fukunaga M, Oka M, Ichihashi M, Yamamoto T, Matsuzaki H, Kikkawa U. 2001. UV-Induced Tyrosine Phosphorylation of PKC delta and Promotion of Apoptosis in the HaCaT Cell Line. *Biochem Biophys Res Commun* 30; 289(2): 573-579.
- Glaser R. 1992. Current concepts of the interaction of of weak electromagnetic fields with cells. *Bioelectrochem. Bioener* 27: 255-268.
- Hinsenkamp M, Jercinovic A, De Graef Ch, Wilaert F, Heenen, M. 1997. Effects of low frequency pulsed electrical current on keratinocytes in vitro. *Bioelectromagnetics* 18 : 250-254.
- Hsu M, Andl T, Li G, Meinkoth, JL Herlyn, M. 2000. Cadherin repertoire determines partner-specific gap junctional communication during melanoma progression. *J Cell Sci* 113: 1535-42.
- John CF, Morris K., Jordan BR, Thomas B, Mackerness S. 2001. Ultraviolet-B exposure leads to up-regulation of senescence-associated genes in *Arabidopsis thaliana*. *J Exp Bot* 52(359): 1367-73.
- Jost M, Kari C, Rodeck U. 2000. The EGF receptor-an essential regulator of multiple epidermal functions. *Eur J Dematol* 10: 505-510.
- Kaiser, F. 1988. Theory of non-linear excitation. In: Frolich H. et al. (Eds) *Biological coherence and response to external stimuli*. Springer Heidelberg Germany, pp. 25-48,
- Kang, MK, Bibb C, Baluda MA, Rey O, Park NH. 2000. In vitro replication and differentiation of normal human oral keratinocytes. *Experimental Cell Research*. 258: 288-297.
- Karabakhtsian R, Bronde N, Shalts N, Kochlaty S, Goodman, R, Henderson AS. 1994. Calcium is necessary in the cell response to EM fields. *FEBS Letters* 301: 53-59.
- Laemmli UK. 1970. Cleavage of structural proteins during the assembly of the head bacteriophage T4. *Nature* 227: 680-685.
- Leszczynski D, Pitsillides CM, Pastila RK, Rox Anderson R, Lin CP. 2001 Laser-beam-triggered microcavitation: a novel method for selective cell destruction *Radiat Res* 156(4): 399-407.

- Liburdy, RP. 1992. Calcium signalling in lymphocytes and ELF fields: evidence for an electric field metric and a site of interaction involving calcium ion channels. *FEBS Lett* 301(1): 53-59.
- Lisi A, Pozzi D, Pasquali E, Rieti S, Girasole M, Cricenti A, Generosi R, Serafino AL, Congiu-Castellano A, Ravagnan G, Grimaldi S. 1999. Three dimensional (3D) analysis of the morphological changes induced by 50 Hz magnetic field exposure on human lymphoblastoid cells (Raji). *Bioelectromagnetics* 21 (1): 46-51.
- Medema JP, Sark MW, Backendorf C, Bos JL. 1994. Calcium inhibits epidermal growth factor-induced activation of p21ras in human primary keratinocytes. *Mol Cell Biol* 14(11): 7078-7085.
- Peus D, Hamacher L, Pittelkow MR. 1997. EGF-receptor tyrosine kinase inhibition induces keratinocyte growth arrest and terminal differentiation. *J. Invest Derm* 109: 751-756.
- Phillips JL, Haggren W, Thomas WJ, Jones TI, Adey W. 1992. Magnetic field-induced changes in specific gene transcription. *Biochimica Biophysica Acta*. 1132: 140-144.
- Pilla AA, Markov MS. 1992. Bioeffects of weak electromagnetic fields. *Rev Environ Health* 10(3-4): 155-169.
- Pletnev, SD. 2000. The use of millimeter band electromagnetic waves in clinical oncology. *Crit Rev Biomed Eng* 28(3 - 4): 573-587.
- Rusovan A and Kanje M. 1992. Magnetic fields stimulate peripheral nerve regeneration hypophyctioma rats. *Neuroreport* 3 (12): 1039-1041.
- Santoro N, Lisi A, Pozzi D, Pasquali E, Serafino A, Grimaldi S. 1997. Effect of extremely low frequency magnetic field exposure on morphological and biophysical properties of human lymphoid cell line (Raji). *Biochim Biophys Acta* 1357: 281-290.
- Savitz DA, Pearce N, Poole C. 1987. Update on methodological issues in the epidemiology of electromagnetic fields and cancer. *Epidemiological Reviews* 15: 558-566.
- Schlegel R, Phelps WC, Zhang YL, Barbosa M. 1988. Quantitative keratinocyte assay detects two biological activities of human papillomavirus DNA and identifies viral types associated with cervical carcinoma. *EMBO J*. 7 3181-3187.
- Solomon B, Hagekyriakou J, Trivett MK, Stacker SA, McArthur GA, Cullinane C. 2003. EGFR blockade with ZD1839 ("IRESSA") potentiates the antitumor effects of single and multiple fractions of ionizing radiation in human A431 squamous cell carcinoma. *Int. J. Radiation Oncology Biol. Phys.* 55: 713-723.
- Stauffer PR, Sneed PK, Hashemi H, Phillips TL. 1994. Practical induction heating coil designs for clinical hyperthermia with ferromagnetic implants. *IEEE Trans BME* 41: pp. 17-28.
- Szabo I, Rojavin MA, Rogers TJ, Ziskin MC. 2001. Reactions of keratinocytes to in vitro millimeter wave exposure. *Bioelectromagnetics* 22: 358-364.
- Tenforde, TS. 1995. Interaction of extremely low frequency electric and magnetic fields with humans. In Polk, C., Postow, E. (Eds) "Handbook of biological effects of electromagnetic fields". 2nd Ed., CRC Press, Boca Raton, pp 185-230.
- Vasioukhin V, Bauer C, Degenstein L, Wise B, Fuchs E. 2001. Hyperproliferation and defects in epithelial polarity upon conditional ablation of alpha-catenin in skin. *Cell* 23: 104 (4): 605-617.
- Walleczek J. 1992. Electromagnetic field effect on cells of the immune system: the role of calcium signalling. *Faseb Journal* 6 : 3177-3185.
- Weaver JC, Astumian RD. 1990. The response of living cells on very weak electric fields: the thermal noise limit. *Science* 247: 459-462.
- Zhadin MN. 2001. Review of Russian literature on biological action of DC and low-frequency AC magnetic fields. *Bioelectromagnetics* 22(1): 27-45.

About the Physical Carrier of Weak Action on Biological System.

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Abstract*

There are smallest particles of "sub-electron level" in a nature, what has been predicted by physicists-theoreticians. Some of them have a special important (they form, in particular, electron). One of them ("eleptino") has electric dipole moment and the second ("electrino") has magnetic dipole moment. "Eleptino" is a carrier of energy and information. This particle has three modes of motion and can resonate with all kind of electromagnetic oscillation in a wide frequency range. The flow of "eleptino" continuously come from space to the Earth and interacts with its electromagnetic fields.

The "Eleptino" is easily controlled by weak electromagnetic fields. It is able to form an energy-information coupling in liquid and biological systems. It forms an energetic field of atoms and biological cells and keeps their integrity. Almost all theories have predicted a non zero value for electric dipole moment of fundamental particles from CP and T Violations. Non ideality of a gas of "eleptino" and creation of Bose-condensate has energy, pressure and longitudinal waves even for zero temperature. It can explain many mysterious phenomena in a field of extra-weak interactions, including the coupling of consciousness with physical and other objects. Considering, as an example, a confinement of these particles near the Earth due to Abraham force we estimate an order of magnitude of some characteristic of the particles.

Reference:

E. V. Mudretskaya, *Zemnaya Fizika I real'nost'. Vzglyad izvene (Heart Physics and reality. A View from Without)* (Zadruga, Kiev, 2000)

*from European Scientific community conference Amsterdam 2000

Dossier Piccardi 2003

INTRODUZIONE

Gli articoli che qui di seguito proporrò all'attenzione dei lettori, sono la conseguenza di alcune considerazioni che sono state fatte sul prof. Giorgio Piccardi da un noto periodico italiano .

Di conseguenza si succederanno nell'ordine : l'articolo del periodico ; la replica di alcuni Studiosi dell'Università di Firenze, i quali furono diretti collaboratori del compianto Piccardi nelle sue ricerche coi test colloidali (replica di recente pubblicata dal periodico stesso sopra accennato) ; ed infine la replica conclusiva del Vice-Presidente del CIFA, comitato questo, fondato da Piccardi il 7 settembre del 1969, a Montreux , dopo il 5° Congresso dell'ISB .

Egli destinò il CIFA a divenire un organo internazionale per lo studio interdisciplinare dei fattori ambientali che sono all'origine dei fenomeni fluttuanti sia nelle scienze esatte che in quelle naturali ed umane. Piccardi ne ottenne la Sede Sociale presso l' Université Libre de Bruxelles.

Faraone Piero A. R.

Giorgio Piccardi, scienziato a modo suo

di Silvano Fuso

Giorgio Piccardi nacque a Firenze il 13 ottobre 1895 .

Nel 1922 si laureò in chimica e divenne assistente di Luigi Rolla. Nel 1938 vinse una cattedra a Genova, dove fondò l'Istituto di chimica-fisica e un laboratorio di spettroscopia.

Nel 1945 tornò a Firenze, dove creò l'Istituto di chimica-fisica che diresse fino al 1965. Fino al 1951 la sua attività scientifica si svolse brillantemente in diversi settori : processi elettronici e potenziali di ionizzazione, il sistema periodico, spettroscopia atomica e molecolare e sue applicazioni in campo industriale, archeologico e astrofisico, fenomeni di superficie e relative applicazioni in campo biologico. Dopo il 1951 la sua attività si rivolse invece allo studio di un campo decisamente etero- dosso : quello dei fenomeni fluttuanti. Piccardi osservò una grande variabilità e apparente non riproducibilità nella precipitazione di alcune sostanze in soluzione acquosa. E mise a punto "test chimici" che consistevano nel miscelare due reagenti per ottenere un precipitato.

Per oltre vent'anni, con i suoi collaboratori, eseguì un numero impressionante di test, condotti in diverse condizioni e in luoghi differenti. E , dall'enorme mole di dati raccolti, credette di poter individuare vari tipi di fluttuazioni che interpretò in base all'influenza di diverse cause esterne. In particolare, Piccardi credette di aver individuato una dipendenza dalla velocità con cui la Terra si muove intorno al Sole nei vari periodi dell'anno e dall'attività magnetica del Sole (ipotesi solare). Perciò iniziò a collaborare con illustri astrofisici, come Guglielmo Righini. A Firenze Piccardi fondò il Centro universitario dei fenomeni fluttuanti (CUFF) che diresse fino alla morte. Nel 1967 il CUFF divenne un'unità della World University, e assunse il ruolo di centro guida a livello internazionale per lo studio dei fenomeni fluttuanti. Piccardi ricoprì inoltre la carica di presidente del CIFA (Comitato Internazionale per lo studio dei fenomeni dell'ambiente), con sede a Bruxelles. Durante la sua attività scientifica, Piccardi fu autore di oltre 200 pubblicazioni apparse in Italia e all'estero e fu insignito di diverse onorificenze. Morì a Riccione il 22 dicembre 1972. Un amico ebbe a dire "Giorgio Piccardi, maestro del Sole, scomparve nel giorno del solstizio d' inverno".

L'opera di Piccardi fu ampiamente citata da astrologi e altri pseudoscienziati nel tentativo di fornire un fondamento scientifico alle loro materie. Per questo, da un lato dovette prendere le distanze e difendersi da chi voleva usare le sue teorie a sostegno di discipline pseudoscientifiche; dall'altro dovette battersi per vincere lo scetticismo e l'indifferenza che il resto della comunità scientifica manifestava nei confronti delle sue ricerche .

Nel 1978, l'ungherese Mihály ha esaminato i suoi lavori, criticandone l'eccessiva fiducia nella valutazione qualitativa dei fenomeni. Nonostante Piccardi sottoponesse ad analisi statistiche i risultati dei suoi test, ogni dato era ottenuto in modo qualitativo. In tutta la sua opera emerge poi una preoccupante tendenza a una grossolana approssimazione: uso di acqua potabile anziché di acqua distillata, concentrazioni approssimate, strumenti di misura poco precisi e così via.

In assenza di qualsiasi standardizzazione dei campioni e delle condizioni di reazione, non c'è da meravigliarsi che i fenomeni appaiano come non riproducibili . Attribuire poi la non riproducibilità a cause extraterrestri appare un salto concettuale davvero azzardato.

Nessuno ha motivo per dubitare della buona fede di Piccardi; egli credeva nei risultati delle sue ricerche e pagò di persona le conseguenze della sua fede in teorie eterodosse. Fu uno scienziato autentico che amava il proprio lavoro e la ricerca disinteressata della verità. Peccato che sia stato vittima di un autoinganno, che lo spinse a credere in fenomeni che esistevano soltanto nella sua mente.

[*il suddetto articolo qui trascritto, è stato pubblicato sul periodico "Le Scienze", maggio 2003, pag. 118]*

Un riconoscimento a Piccardi

Caro direttore ,

i sottoscritti facenti parte del Laboratorio di ricerca educativa del Dipartimento di chimica dell' Università di Firenze ritengono utile inviarle le seguenti precisazioni, avendo studiato e collaborato con il professor Giorgio Piccardi .

Diversamente da quanto afferma l'articolaista, il professor Piccardi non studiava fenomeni chimici sulla base di un metodo <qualitativo> ma invero é stato un precursore nello studio statistico della termodinamica dei processi lontani dall'equilibrio chimico, resi poi famosi dal premio Nobel per la chimica (nel 1977) Ilya Prigogine. Pertanto il professor Piccardi, per nostra diretta conoscenza, non fu certamente < un affiliato a teorie ortodosse > come é scritto testualmente nell'articolo in oggetto .

Infatti Giorgio Piccardi eseguì le sue ricerche con estrema attenzione alla standardizzazione dei procedimenti di precipitazione dell'ossicloruro di bismuto. Gli esperimenti venivano eseguiti con uno strumento chiamato <Miscelatore Sincrono>, che eseguiva contemporaneamente venti precipitazioni con concentrazioni predefinite e con quantità opportunamente calcolate, nel quadro di un < metodo differenziale >. Quindi le prove non erano influenzate nè dalle variabili termodinamiche tradizionali (temperatura, pressione) e neppure dalle condizioni chimiche interne al sistema di reazione e cioè impurezze dei reattivi e qualità dell'acqua e così via .

L'effettiva <non> riproducibilità sequenziale nel tempo di tali <fenomeni fluttuanti> é stato il vero scopo che ha condotto il professor Piccardi allo studio di una loro possibile riproducibilità vista in funzione di cause esterne al sistema di reazione. Quanto sopra é stato eseguito con perseveranza dal professor Piccardi, mediante un'indagine statistica durata trent'anni, nei quali giornalmente i test venivano eseguiti a ore prestabilite ben tre volte al dì .

L'andamento fluttuante dei test ha condotto il professor Piccardi a capire che la dominante influenza sulle fluttuazioni era dovuta all'attività solare. Fu trovata infatti un'ottima correlazione con il numero di Wolf che rende conto del numero e dell'estensione delle macchie solari .

Pertanto il fine ultimo dello studio di Giorgio Piccardi é stata proprio la ricerca della riproducibilità nel tempo dei <fenomeni fluttuanti> in condizioni di non equilibrio termodinamico di sistemi eterogenei .

Per le persone che volessero approfondire le conoscenze sui fenomeni fluttuanti, facciamo presente che presso la Biblioteca di chimica dell'Università di Firenze (c/o il Polo scientifico universitario di Sesto Fiorentino) si trova la collezione di tutte le pubblicazioni scientifiche del professor Giorgio Piccardi e anche il libro *I segreti dell'acqua : l'opera scientifica di Giorgio Piccardi* di P.Mazzelli, G.Masini, M.Costa, Di Renzo editore, Roma, 1994.

Paolo Mazzelli, Maria Grazia Costa e Marco FONTANI
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[Il suddetto articolo, qui trascritto, é stato pubblicato in riferimento al precedente, sul periodico "Le Scienze", agosto 2003, pag.8]

“ Il vero lo é quello che tu sei , non quello che hanno fatto di te...”

Egregio Direttore,

ho potuto notare, nel numero di Agosto della sua rivista "**Le Scienze**", la **pubblicazione** di un articolo di alcuni chimici fiorentini a seguito di quanto scritto da un suo collaboratore nel n° 417 di maggio, a pag.118 (*Giorgio Piccardi , scienziato a modo suo*) . Quanto é stato riferito dagli studiosi fiorentini, é condiviso da me che ho avuto come loro, la fortuna di conoscere il prof. Piccardi .

I più, definivano P. un uomo del Rinascimento prestatato al nostro tempo ; di intelligenza vivace e intuitiva non era solo uomo di studio ma pure di eccellente cultura ; e il suo modo di proporsi all'attenzione di un interlocutore era quello di un vero gentiluomo .

Amava la Natura, e questa sua profonda appartenenza la lasciava trasparire di fronte a chiunque, attraverso la sua sensibilità intuitiva che sapeva armonizzare cogli slanci del suo entusiasmo come uomo d'iniziativa e con la sua grande curiosità come studioso ma sempre con l' umile consapevolezza dei propri limiti, che mai però lo scoraggiava nell'impegno e nella determinazione che sempre lo animavano.

Era innamorato della conoscenza e tutta l'intelligenza illuminata che gli era propria, dava un equilibrio alla sua personalità che affascinava attraverso la grande coerenza di fondo che concettualmente sapeva esprimere. Non si risparmiava in generosità e nella partecipazione alla vita affettiva famigliare.

Proseguo chiarendo che come medico e come microbiologo, non scenderò in dettagli che riguardino argomenti di chimica o di fisica troppo specifici ; penso tuttavia di avere elementi di conoscenza sufficienti per intendermi in generale sia con i chimici che con i fisici in argomenti d' interesse comune .

Gentilmente mi permetta, ora, di sottoporle alcune considerazioni :

il Piccardi facendo i suoi esperimenti ha macinato lavoro, ha fatto ipotesi, è ricorso a geniali soluzioni pratiche, ha interpretato fenomeni, ha dato stimoli e suggerimenti..... : non dovrebbe dunque essere il tempo a confermare le sue intuizioni, il suo lavoro ? ma ciò, s'intende, attraverso la **"staffetta di altri studiosi come lui"** che ne abbiano colto il segnale [*] .

Ora, tale staffetta , non sarà di certo costituita da gente che ostenti giudizi sommari che non lascino convinti nessuno che si senta veramente uno studioso .

Lo studioso é cauto, rispetta d'istinto un uomo come P. : un uomo così non gli crea nè paura nè invidia, gli induce invece un positivo effetto stimolante a fare approfondimenti e verifiche ma soprattutto non lo induce assolutamente, a seppellirlo nel dimenticatoio .

Solo l'evolvere della ricerca dovrebbe fare arrivare ad un giudizio su di lui che tanti affannosamente cercano di dare a tutti i costi prima del tempo : pur *di far notizia* e magari trascurando il rispetto umano di chi si ha di fronte. Essere obiettivi e ben circostanziati nella critica, costa impegno e soprattutto competenza professionale ; e questa , *chi non ce l' ha non se la può dare...*

Avere conosciuto un uomo come P.spinge moltissimo ad assumere per la sua persona, posizioni decise come le mie .

E un uomo come P., dovrebbe secondo il suo articolista, esser rimasto vittima di un **autoinganno per ventanni ed oltre , sempre di seguito?**...ma scherziamo ? su andiamo !.. esprimendosi **così** chi ha scritto rischierebbe di far pensare ch'egli alluda ad un caso di autentica paranoiae P. vivaddio !.. era tutt'altro : non so se ridere o piangere ,mi creda, di chi si sia esposto così sprovvedutamente nel *giudicare* uno studioso di tutto riguardo come P., che più avanti nel testo, lo stesso articolista ritiene poi di dover definire...**scienziato autentico** .

Nel senso comune , **scienziato** si potrebbe definire, nel consenso generale degli studiosi, quello studioso che ha fatto scienza , cioè che ha elargito conoscenza a tutti noi ; e questo, davanti non solo al mondo accademico o a chi ritiene di conferirgli un premio Nobel od altro riconoscimento ma davanti, *in primis* , all'interesse dell'Umanità intera. In passato questa presa di coscienza ha richiesto, in varie circostanze, pure tempi lunghi , facendo anche rischiare la vita a chi si fosse cimentato a fare certe *rivoluzioni scientifiche* non gradite ai potenti .

Ora se l' articolista conclude, *sua sponte* , definendo P. "*Scienziato autentico*" , questa definizione ahimè, con il contesto espresso dal suo articolo....non ha per me alcuna possibile compatibilità .

Le dichiarazioni dell'articolista poi, per il loro peso, non avrebbero dovuto esigere a loro necessario sostegno, una messe di argomentazioni e di citazioni bibliografiche a non finire, davanti ad una platea come quella dei suoi lettori !?..

Quanti studiosi P. ha scomodato ? Tanti !....consideri soltanto quanti test colloidal é riuscito a far fare in giro per il nostro pianeta, a varie latitudini e in vari laboratori..... Erano tutti così docilmente disponibili..?

il dubbio non viene ? ha notato che oggi P. suscita ancora autentiche reazioni positive ?

Il vero "difetto" (se così si può dire), che hanno le **esperienze di P.**, é che sono ad un tempo, tecnicamente molto delicate e altrettanto molto impegnative .

Impegnative, perchè sono necessariamente da protrarsi molto nel tempo .

I fenomeni fisici ai quali P. si riferisce, appartengono a dimensioni solennemente grandiose : quelle dei fenomeni di scala cosmica che agiscono sulla biosfera e possono essere interferiti da possibili disturbi estranei all'esperimento .

Se si vuol fare una critica adeguata quindi bisognerebbe rimbocarsi le maniche e ripetere a lungo quelle stesse esperienze fatte da P. e solo di qui partire con osservazioni scientifiche calzanti, emerse via via dal proprio lavoro di verifica.... altrimenti :

o si sta in un **doveroso silenzio** **o** si assume un **atteggiamento di equidistanza**, citando e bilanciando fra loro vari giudizi, che studiosi accreditati , pro e contro , abbiano espresso nel tentare di capire al meglio, il valore di ciò che P. ha studiato e realizzato ! questo, mi parrebbe giusto .

Circa poi le possibili interferenze ambientali , queste potrebbero restare ridotte o addirittura eliminate , come fossero *crusca*, attraverso l'implacabile *setaccio* del persistere della sperimentazione nel tempo ma...in termini di molti anni ; venti, trenta ed anche di più ; consentendo cioè alla fine di far stilare un **utile giudizio d'assieme** [ad es., coll' *evidenziare ritmi che si ripetano periodicamente* ; come si é fatto fin dal 700 per *l'attività solare* , poi risultata di ciclo undecennale ; *attività espressa attraverso la variazione delle macchie solari* ; veda pure , prego, "**LE SCIENZE**" *quaderni : Il Sole, n°1, ottobre 1982, pg.75*] .

Concludendo quindi, é soprattutto lavorando di persona su grandi quantità di dati , che si possono azzardare critiche ben motivate verso chi ha sperimentato prima di noi, quel certo tipo di indagine, quel certo tipo di ricerca .

E a tal proposito ben venga l'osservazione preziosa che il Nobel per la Medicina A.Carrel ebbe a fare :

"Short observing and much reasoning lead into the error ; much observing and short reasoning lead into the truth".

E mi permetta di fare infine anche un breve accenno sugli **astrologhi** .

Perchè questi signori resistono ancora oggi ? é un tempo ricco di conquiste scientifiche il nostro come mai prima !.. e allora perchè capita di farli notare ancora così in evidenza questi signori ?...

Dio ci liberi da cartomanti, da astrologhi e similari ma ci sono !.. la gente li vuole e i mass media glieli danno...come a tenersi *bambina* tanta gente e...non farla crescere per accontentarla magari più facilmente: almeno finchè é possibile, finchè ce la si fa !..

E' purtroppo una filosofia accomodante che da una parte denota una certa impotenza culturale e dall'altra forse una buona dose di opportunismo commerciale .

Fece bene dunque P. a difendersi ma qualcuno, si vede, che maliziosamente cercava sempre di cacciarglieli fra le gambe questi astro-sognatori ; cattiverie? invidie ?..

Ma eccoti pure certi articoli qua e là, che ad essere generosi si possono considerare a livello di pura e semplice oziosa chiacchierata : come quelle che a volte si possono fare al caffè in un gruppo di amici, magari annoiati , sì !...ma compiacenti pur di ammazzare il tempo .

E non solo ! ma pure per fare scena, per apparire tuttologhi at all ! e quindi informati perfino di argomenti particolari come questo . In poche parole si arriva al pettegolezza , tentandone magari una sorta di bella copia se poi lo si vuol mettere anche per iscritto .

Ora, per chiudere, sono tentato di riportare alcuni dei versi significativi che scrisse il sommo Albert Einstein in risposta a un'impertinenza che non risparmiò perfino **lui** e fu di un suo esimio intimo conoscente [questi infatti, gli aveva proposto ironicamente di mettere in versi la sua Teoria sulla Relatività] :

< *Io sono come sempre l'organista
che non può fare altro che girare e girare
fino a che il passero lo canta dal tetto
e l'ultima canaglia lo comprende .* >

Il P. invece non è più in grado di rispondere purtroppo, al suo articolista : con quell'arguta e fine ironia che come fiorentino gli era propriapeccato !!

Il rispetto umano, quello vero, é una grossa garanzia per un' accettabile convivenza ! personalmente ne resto sempre più convinto [forse perchè ho pure una certa età...] ma è merce rara oramai. Ne conviene ?

Un saluto da chi è un lettore fra i tanti del suo attento periodico che, in tale circostanza, ha subito a mio avviso, solo un amaro ed increscioso incidente di percorso . Capita... purtroppo !

Faraone-Piero A.R.(**), Vicepresidente

del CIFA.

ANNOTAZIONI :

[*] **Piccardi** nella sua relazione fatta al V Congresso Bioclimatologico Internazionale di Montreux (Suisse), del 1969, manifestò tutta la sua speranza perché il suo messaggio di studioso fosse raccolto .

Citerei alcuni passi significativi, alla conclusione di quanto espose, circa i dati salienti delle sue ricerche coi tests colloidali, e sui fenomeni fluttuanti messi con questi in evidenza :

<< La fenomenologia mostrata a mio parere, é incompleta. Ho l'impressione che variabili molto importanti giuochino ben più profondamente di quelle prima citate. Mi si dirà che le impressioni non sono materia scientifica ma io trovo che sarebbe stupido e non scientifico, il non mettere sull' avviso gli uomini di scienza a questo riguardo.

Il valore numerico dei test chimici non può dirci tutto. Quel valore é relativo, perché il metodo dei test chimici é differenziale. Ma il comportamento dei colloidali mostra che esiste qualche cosa che non é valutabile mediante una differenza ma che potrebbe essere valutato, forse , in base ad una misura assoluta.

.....

.....Debbono esistere fenomeni molto più grandi e profondi di quelli che noi abbiamo considerato fino ad oggi. Non posso sperare di venire a capo di questa fenomenologia appena intravista ma voglio sperare che ciò che ho detto ora possa interessare coloro che si dedicano alle scienze della vita.

.....

.....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, sempre strettamente selettivi e perciò incapaci di avvertire una situazione generale .

.....

.....La parola sarà ancora una volta allo studio dei fenomeni fluttuanti ed alle scienze della vita >>.

[**] **dr. Faraone P.**, *Medico Igienista con indirizzo Microbiologico* , già all' Istituto d'Igiene dell'Univ.di Milano poi al Labor.Prov.Igiene Prof. di Milano **quindi** come Direttore Medico, al Labor.Prov.Igiene e Prof. di Roma, divenuto in seguito Presidio Multiz. di Prev. [1976-1991] . **Attualmente** Coeditore del periodico CIFA News, c/o il Centro Biometeorologico in Roma, diretto dal prof. Messina Baldassarre e coordinato dal dr. Valenzi Vincenzo .

G. PICCARDI- THE SIGNIFICANCE OF THIS DISCOVERY BECAME UNDERSTOOD ONLY NOW

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Celebrating the 30th anniversary of CIFA it may not be out of place to remember one of the founders of this associations -prof. G. Piccardi (1995-1972). Let us appeal to this works which hold an important place in the investigations of solar-terrestrial relations. It was Piccardi who formulated the most significant empirical generalisation based on his experiments on the data of other scientists. Essentially modern model conception in this field stand in this consideration. While the founder of heliobiology A. L. Tchizhevsky studied the influence of cosmic agent upon biological and social system, G. Piccardi's the main object of investigations was cosmic action upon physio-chemical system. (By the way both of the scientists were interested very much in the scientific results of each other with great interest).

Now it is very curious and instructive to trace the Piccardi's investigations in solar terrestrial relations in their development as well as the following destiny of his works (of course, his special studies in physical chemistry are not considered in this article). The researches of <<activation>> of water were the initial point of Piccardi's investigations in the middle of 30th years (1935). It was found that some physical action upon water modify (without any changes in the chemical structure) its parameters and characteristics. After the <<activation>> such water properties as surface tension, electric condition, viscosity and so on varied, centre of crystallisation appeared in all the liquid volume. Certainly many important aspect of this process and the different methods of water <<activations>>-<<magnetic treatment>> were revealed much later [1,2]. The first physical model of this complex phenomena [3] was made only then mass usage of a new procedure of <<activation>> took place (patent of T. Vermeiren, 1945).

G. Piccardi used for <<activation>> so called <<vessel of R. Abbot>> (1933 year patent). It is a glass sphere with a long holder. Within of the sphere there is a tiny drop of mercury that moves in the atmosphere of neon. To achieve the water <<activation>>, this device was applied (the activation of water was achieved by mixing of water with this device. Negative attitude of scientific community towards some Piccardi's experiments was caused by usage of this instrument . The theory of Abbot vessels had been revealed 25 years later after their invention. Long time the practice of this <<activation>> method looked like a magic ritual procedure. Now it is well known that the move of mercury drop in the vessels generates impulse electromagnetic emission with the frequency about 4kHz, hereby <<usual>> magnetic treatment of the water take place. But what would Piccardi can answer to sceptics reporting his the important finding the experiments of water <<activation>> do not reproduce every time (1935)? It all looked like as if an unknown, uncontrolled physical agent acted upon the results.. And the intensity of this agent depended on the time of day and season.

A substantial step in understanding of the physical nature of mysterious agent was made when Piccardi began to use the thin metallic screens (1936) in his experiments. It was found that the action of this agent upon activated water solution was modified when this solutions was covered by box made from copper foil with thickness 0,1 mm. These results were studied and examined thoroughly in the following years and became the most important discovery of Piccardi (knew nothing about of the experiments of the same type of A. L. Tchizhevsky and P. M. Nagorsky (the screening of biological objects, these data had not published yet). It was the experiments which allowed Piccardi to present the final variant of his famous physio-chemical test. It should be reminded that these tests present the differential measurements of precipitation rate of the products of hydrolysis of bismuthrichlorid in

water. The BiCl_3 is prepared beforehand using bismuth carbonate $\text{Bi}_2(\text{CO})_3$ and a 1,5 M hydrochloric acid. All the measurement are statistical ones at one time with help special device trichlorid of bismuth is poured out into fixed number of beakers with water. After the precipitation of white loose deposit of bismuthoxychlorid, BiOCl , a clear border line appears in the beakers. The tests were carried out in the following three modifications (of the water in the beaker).

Name of test	Condition I	Condition II
P	Normal water	Normal water under copper screen
F	Normal water	Activated water
D	Normal water under copper screen	Activated water under copper screen

(index of the corresponds to the difference between conditions I and II)

This simple but carefully elaborated technology allowed making mass experiments by hands of unqualified personnel using substances without special purification.

Since 1951, the systematic monitoring of the tests was carried out (first in Florence only-three times a day, later in many other places). It should be marked that should in this year, S.E. Shnol has been revealed the abnormal dispersion of activity of actomyosin enzyme- it was beginning of a new important research program which investigate the macroscopic fluctuations.

The continuation of these researches conditioned some further important discoveries:

1. The analysis of the data of monitoring during several years has demonstrated that are statistically significant correlations between tests figures and the integral indices of solar activity along with global indices of magnetic disturbances. A relation between electromagnetic background variations and these indices has been established reliably in 1950th years. So for many scientists the correlations mentioned above seemed to be rather paradoxical and unreal. In scientific community the distrusts towards the Piccardi's results last up to now. Meantime the data considered have been analysed by independent expert using the cosmophysical indices unknown in the year of the observations. Thus, the data gathered in Florence showed clearly the effect of sector of structure of interplanetary magnetic field[4]. It has been obtained that precipitation for the test F slows down in the day of negative polarity. This effect takes place only for measurements with activated water (test F). Now it is well know that polarity change is always accompanied by variations of electromagnetic spectrum in our environment. Since electromagnetic field influence upon activated water, the result mentioned above is obvious. The effect of the change of polarity of interplanetary magnetic field in the test F has been confirmed by independent authors using independent data (where another method of activation of water has been used, Toms, 1968, 1979-71, [5].

2. The influence of weak electromagnetic fields with the frequency 10 kHz upon precipitation rate of bismuthoxychloride has been revealed in the special experiment (1956) [6]. The sensitivity of the Piccardi's test to weak electromagnetic field in extra low frequency range was also confirmed by independent groups (eg [5]. These discovery has later led to creation of an uniform logical scheme covering the whole set of phenomena: electromagnetic field activate water solutions; natural electromagnetic field in the environment (with other parameters) influence upon results of activation (variations of such fields are connected with solar activity), these natural electromagnetic fields act as the <<uncontrolled physical agent>>, and have relations with sunspots number. Thus, an idea about water as universal receptor of weak action appeared [7].

3. At last, a special experiment was carried out on purpose to demonstrate that uncontrolled outside factor take place not only in water solutions (the P- test- congelation of melted naphthalene in sealed vials [8]. Unfortunately, this experiment had no proper development. However, it was the first clear evidence that regularities obtained in the experiments have general (global, total?) nature and take place in all condensed substances. Probably for the first time the relation between <<fluctuating phenomena>> and <<macroscopic fluctuations>> has been found [9].

As water has the exceptional position in all biological processes, the influence of uncontrolled agent upon many (all) biological system must manifest itself necessarily. Obviously G. Piccardi understood in the beginning of 1950th and carried out the biological P-test (time of coagulation of man's blood with application of screen).

There is another way to demonstrate the relation (trivial in our days) to find a correlation between chemical and biological tests. The most effective results was obtained when two independent sets of measurements were compared the rate of growth of rice seedlings in phytatrone and variations index of the chemical T test (the coefficient of the correlation-0.92, with the delay 21 hours) [10]. So an empirical relation of G. Piccardi's works with investigations of A L Tchizhevsky has been established.

Certainly it is not possible to talk over all the work of Piccardi with assistants in the frame of one article. One may find many interesting details and wide bibliography in his well know monograph [11]. A dust cover of this book represents <<helicoidal motion>> of Earth in pace. This Piccardi's model didn't find any response in modern geophysics, now it seems unnecessary. The uncontrolled physics agent investigated by Piccardi vary in time and space because other reasons. Now Piccardi –moving around Sun the Earth has never come back to the same point. So in the Universe there are no phenomena which could be fully reproduced . Experimenters should understand that every one second is different from another one.

In summer 1964 G. Piccardi visited Russia (URSS). He could not see A. L. Tchizhevsky (the famous Russian scientist was very ill then), but he met other scientist which were interested in his study. Piccardi was interviewed by correspondent of popular magazine <<Science and life>> Yu G. Shishina [13]. We should like to conclude this brief study on Piccardi' work with some quotations extracted from the interview:

<<I live just in the same town where Galileo spent (led) his last years as a prisoner. He was taken into custody, judged and condemned because he has destroyed illusions which were (supposed to be) sacred for majority. He has demonstrated that the face of the Sun is changeable (erratic, unstable) and periodically the Sun is covered by spots. Galiley's power full mind removed the myth about dead, fixed (static, stationary) but comfortable Universe. He filled Universe with life and motion. <<Provando e riprovando!>> - <<Esamine and examine over!- that was the motto of <<Academy of natural science>> established by the pupils of long –suffering scientist in Firenze. The ideas of Galiley triumphed after his death, though the great scientist himself became a victim of conventionality of mind, which followed dogma.

Bitterness (obstinacy) in defending of the old scientific theories is a certain measure of vitality and significance of new ideas, 30 years already I have been investigating the most simple and at the same time the most mysterious substance in the Universe- plain water. The chapter <<Water>> in the Great Book of Knowledge takes the most important place, but this chapter is only initiated.

Imagine my astonishment working with colloid solutions. I have revealed that the same reaction of precipitation (if it is sensitive enough and with the other equal conditions) takes different time and has different rate. The reaction depends on the point of time-it was hard to believe. Since I could get evidences that the non-reproducibility of some water reactions depends on outside reasons (16 years of work), I decided to use amazing characteristics of water to prepare special colloids-chemical tests. Such tests could be original litmus paper- an indicator of space variations. What has become clear after long-term intensive work? The main reason of chemical reactions rate variations was <<its Majesty Great King>>- the Sun and its escort disturbances in the ionosphere, magnetic storms, electromagnetic waves, induced by solar activity on the Earth. But if inorganic colloid solutions are so sensitive to Universe perturbation, what's happened with biological systems- much more sensitive?

Now it is time to think by very general conceptions even considering local and simple subjects. Everywhere, especially in living organisms, will be revealed presence of the Universe>>.

All these thoughts are obvious and familiar to the participants of our interdisciplinary Seminar. Certainly G. Piccardi could be considered a happy man due to his diligence and remarkable talent of investigator he has made the outstanding discoveries. Simultaneously he is a tragic figure being ahead of his time he hasn't received the recognition of his scientific achievements scientific community.

References

1. Kislovsky L. D. in Influence of solar activity upon atmosphere and biosphere, 1971, pp 147-164 (in Russian)
2. Klassen V.I. Omagnichivanie vodnyh system Moscow, 1982, pp.296 (in Russian)
3. Kislovsky L.D. in: Problems of cosmic biology, v.65, 1989, pp 210-221 (in Russian)
4. Vladrimisky BM in Problems of cosmic biology v 65, 1989, pp 210-221 (in Russian)
5. Opalinskaya A. M., Agulova L.P., Vlijanie : estesstvennyh I iskusstvennyh elektromagnitnyh polei na fisico-himicheskuyu I Elektromagnitnuyuy biologcheskyuy sistemu, tomsk, 1983, pp 110 (In Russian)
6. Piccardi G., Cini R., Geofisica e Meteorologia, v 4, pp. 25-26, 1956
7. Capel-Boute C.: in Proceeding of International Symposium <<Exact, natural and human sciences in the presence of uncontrolled environmental factor, Brussels, 1992, pp 52-84.
8. Papeschi G., Costa M., Geofisica e Meteorologia, v 13 pp 69-71, 1964.
9. Shnol' S. E., Kolombet V. A., Pozharskij E. V., Zenchenko T. A., Zvereva I. M., Konradov A. A., Uspehi fizicheskikh nauk, v 168, N 10, pp 1129-1140, 1998 (in Russian)
10. Verfaillie G. R. M. International Journal of Biometeorology, v 13, N2 pp.113-117 1969.
11. Piccardi G.: The chemical basis of Medical Climatology. Ch Thomas Publisher, Springfield, III (USA), 1962.
12. Piccardi G.: Problem of method, CIFA news N. 1.
13. The Universe is everywhere, the interview with G. Piccardi, by Yu G. Shishina , Nauka I zhizn' (Science and Life), N 8, 1964, pp 62-71 (in Russian).

Could Prof. Piccardi become “fashionable” again?

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Piccardi revisited in a modern lab

In the frame of the research activity pursued at Pirelli Labs S.p.A., we have had the opportunity of reviewing some of the experimental reports published by Prof. Piccardi during several decades of scientific activity. The revival of the early work of this Italian scientist in the field of bioelectromagnetism is a rather uncommon circumstance, and some of the main reasons for it could be worthy of a more detailed comment.

In the last decade, an increasing interest has been paid by the scientific community to the rather challenging and cryptic issue of biological effects mediated by electromagnetic fields (EMF). From time to time, the attention of the public opinion is drawn to this problem, with intensive and sometimes raging discussion among the experts. It is generally accepted that, especially for low-frequency exposure, the minimal energy of the EMF photons and the lack of noticeable effect of induction in non-metallic conductors (like the saline solution enclosed in, or surrounding the cells) cannot cause the disruption of the strong covalent bonds contained in organic molecules, nor can impair the cell's functionality by a temperature increase due to Joule heating. However, several renowned research groups have accumulated a body of evidence that strongly supports the hypothesis of the existence of a non-thermal damage mechanism. Needless to say, this outcome prompts for a wholly new development of physical models able to understand and explain this unexpected feature of condensed matter.

In our attempt to find a theoretical foundation for several phenomena observed by teams collaborating with our lab on cellular membrane damage caused by EMF, we have decided to reconsider the findings of Prof. Piccardi, who –up to our best knowledge- has been the first scientist to devote a significant part of his work to the subject of low-energy interaction in physical chemistry. The corpus of Piccardi's articles is not easily accessible, having been published on old journals more than half a century ago.

Three unusual experiments

It is not within the scope of Pirelli Labs to deal with the mainstream of Piccardi studies (biometeorology, cosmic ray showers effects on living tissues et.c.), so our evaluation has been necessarily restricted to those tests, which could more directly lead to useful insight in the new chemical physics of liquid water exposed to weak ELF.

The attentive review of Piccardi's production, eventually recovered from his co-workers, allowed us to identify a limited number of interesting experiments, whose replication is currently under discussion:

A) Effects of low-frequency EMF on physical properties of water

In year 1964, the group of Prof. Piccardi published an interesting article [Ref.1] in which an extensive series of measurements of water electrical conductivity in different regimes of exposure to 10kHz EMF was reported. It was shown that, in samples of water hermetically closed in conductivity-probing cells, this physical parameter was steadily increasing when the sample was exposed to EMF, while a reference cell, kept at the same temperature but not irradiated, displayed just an initial increase in conductivity destined to flatten in few days. Piccardi left open the route for an explanation in which the ions of the container's glass, passed into the solution, could play a role. Nevertheless, the different answer of the system to the presence (or absence) of the EMF was confirmed beyond any reasonable doubt.

B) Variation of water conductivity because of the previous "thermal history" of the sample

Piccardi claimed [Ref.2] that two sealed samples of water measured in the same conditions but having underwent different thermal cycles (the first was heated up to boiling, the second frozen and molten again), displayed significant differences in the values of electrical conductivity. Effects due to possible solubilization of container's glass ions were studied in detail and shown to be irrelevant.

C) Seasonal variation of water pH

An unexplained, but intriguing, research of the Piccardi team is described in [Ref.3]. Further to an accurate campaign of measurements extended over a year, Piccardi was able to show that the difference of potential between a sample of water stirred for some minutes and a similar sample not stirred was varying during the year. Piccardi made some attempt to correlate this effect with the available data about the incidence direction and strength of the "solar wind", assuming that its very energetic particles could play a role (although unclear) in the phenomenon.

Possible modern explanations of Piccardi's results

As one of the last heirs of the positivistic tradition of the Italian physics of XIXth century, Piccardi focused on the rigorous collection of a huge mount of data supporting his claims, without endeavouring, in general, to frame them in a new theoretical structure. The possible oddities of water behaviour in the liquid phase have, however, prompted in the recent year the renewed effort of several theoretical and applied physicists, that are trying to identify and to prove new models able to justify –for instance- the effects of 50 Hz EMF irradiation on living tissues.

Among many valuable proposals, the pioneering work of the late Prof. Giuliano Preparata [Ref.4] appears to offer new opportunities, yet to be confirmed but potentially most innovative and exciting. According to the research of this author, water could be viewed as a mixture of two phases: an incoherent "gas" of molecules intermixed with an huge number of "coherence domains", volumes of space where the singular molecules of water, interacting with an "entrapped" electromagnetic field, lose their individual character becoming a macroscopic quantum object loosely similar to a supercurrent or a Bose-Einstein condensate. The new object with his collective quantum behaviour could be sensitive to a flux of low-energy incoming photons; moreover, it could act as a "racetrack" able to modify the behaviour of ions present in the solution. Both these effects could have a deep influence on bioelectromagnetism experiments.

The demonstration (if any) of coherence domains' reality could open the way to a new interpretation of Piccardi's work, as the two-phase model of water devised by Preparata and co-workers could allow modifications of the hidden structure of liquid water, by variations of the coherence domains parameters due to thermal or electric effects, all characterized by low amount of exchanged energy.

Piccardi as a teacher of scientific correctness and freedom of thought

Apart from the validity of the scientific route followed by Piccardi –which has still to be confirmed by new experiments- the modern readers of his articles is deeply and sincerely impressed by the attitude of this man toward his research topic, his students and the scientific community. The work of Piccardi was evidently done in a most serious way, and the quest for the truth was evidently a prominent goal for him, in spite of the controversial nature of his studies. Piccardi –according to a recent biography published in Italy- was patient, open to third-party scrutiny, and was even the strictest criticist of his own work. He was well aware that his “solar hypothesis” of cosmic effects on terrestrial experiments (probably due to solar activity, cosmic particles et.c.) made his research dangerously contiguous with non-scientific areas (like astrology et.c.) and he paid the outmost attention to guarantee the highest quality by developing experimental protocols, that even today are striking because of their inherent ingenuity and optimisation. However, he refused the biased “scepticism” which, in the recent years, seems to overwhelm any possibility of discussion on exotic and unconventional ideas.

It is rather discomfoting to observe in 2003 that, after all, the scientific environment in the ‘50s and ‘60s could still accept and gave credibility to the investigations of Piccardi, who –in modern terms- was actually thinking of some “water memory” effect. The same, unfortunately, would not happen today in the academic world, whose hysterical reactions to the issues of Cold Fusion and Benveniste’s ideas are symptoms of a widespread conformism, scarcely compatible with the basic tenets of freedom of thought. Our Lab, without giving any a-priori endorsement to Piccardi’s “solar hypothesis”, deems nevertheless useful to dedicate a moderate and reasonable amount of resources to a topic which in our humble opinion deserved a closer and more thorough analysis.

Riferimenti:

- [Ref.1]: S.Bordi, F.Vannel “Campi elettromagnetici di bassa frequenza e conduttanza elettrica specifica dell’acqua”; Annali di Idrologia, Vol.II, N.4, Ottobre-Dicembre 1964
- [Ref.2]: S.Bordi, F.Vannel “Proprieta’ superficiali e variazioni strutturali dell’acqua”; Annali di Chimica, Vol.52
- [Ref.3]: S.Bordi, G.Papeschi “Indagine per via elettrochimica sull’influsso di campi magnetici naturali sui sistemi chimici”; Note interne dell’Ist. di Chimica Fisica dell’Universita’ di Firenze- 30 Giugno 1963
- [Ref.4]: G.Preparata “QED Coherence in Matter”, World Scientific, 1995 (in particular, chapter 10 therein)

In Commemoration of Madam Carmen Capel-Boute.

Madam Carmen Capel-Boute was born in Buenos Aires in 1914 to a Belgian family.

She became a researcher in the Electro-chemical and metallurgical field at the Science Faculty of Free University in Brussels. Madame Capel-Boute was working with Prof. Pourbaix studying phenomena appearing after physical treatment of water. She suggested several interesting explanatory hypotheses regarding effects of physical factors of low energy on water solutions. In this period she read several of Piccardi's articles about the same study in "Chemical Abstracts" journal published before the 2nd World War.

Madam Capel-Boute was impressed by Piccardi's considerations. When she attended the Conference organized by CITCE* on the coasts of Como's lake and Lago Maggiore, she seized the opportunity to inquire Prof. Piontelli who accompanied her, about Piccardi. She learned, that Piccardi returned to Florence as Director of Chemical-Physical Institute, leaving the Genoa University where he had chemistry-physics chair since 1938.

Eventually madam Capel-Boute met Piccardi when visited Florence in 1950. Piccardi had a long discussion with her and found it very interesting that the water behavior was empirically utilized in the industry. Piccardi believed that some external factors of low energy influenced the variations in effects of water activation. Madam Capel-Boute and Piccardi quickly became scientific partners and their collaboration was very intense. Dr. Capel-Boute became the best collaborator of Prof. Piccardi in completing colloidal the tests and in studying phenomena of fluctuations. Piccardi made his colloidal tests in Florence from 1951 to 1972 and Capel-Boute in Brussels from 1956 to 1978. They obtained interesting results also in the mutual comparisons of their collected data.

Madam Capel-Boute became President of CIFA in 1972 (CIFA was founded by Piccardi in 1969, in Brussels). After Piccardi's death, Capel-Boute continued his work, devoting herself to CIFA, sharing her great enthusiasm and impassioned determination.

In 1987 she left CIFA Presidency, and Prof. E.P.Wedler (Biometeorology Institute of Free Berlin University), replaced her. Three years later, in 1990 Wedler died, and Capel-Boute become again CIFA President in spite of her poor health, age and her other responsibilities as CIFA General Secretary and editor-in-chief of CIFA News.

She accomplished her management-masterpiece, transferring in 1993 CIFA Head Office from Brussels to Pushchino (Russia), maintaining all typical traditions given by CIFA founder Giorgio Piccardi to this Committee. This initiative guaranteed the future of the Committee, and CIFA obtained its new President Prof. Boris Vladimirsky (Crimean Astrophysical Observatory in Nauchny, Ukraine).

Madam Capel Boute recently passed away, and we are greatly saddened. She was close to every one of us, always with her humanity and her "unusual driving power". Her little cottage at the Isola dei Pescatori on the Lago Maggiore, will no longer be the warm site of hospitality for her collaborators and friends. Only the distance separated us from Madame Carmen, but now the distance is too unlimited....

Let's together continue our work, so that our dear Madam Carmen will have again her life through us: She has earned it!

Piero A.R. Faraone, CIFA's Vice-President.

* **CITCE** - Comité Internationale de Termodinamique et Cinétique Electrochimique, founded in the 1949 at Université Libre de Bruxelles