EIR Conference Report

Pasteur's method revived for study of life processes

by Warren J. Hamerman

On June 6 and 7 the Fusion Energy Foundation (FEF) of France staged an extraordinary two-day international conference entitled "The Importance of the Method of Louis Pasteur for Conquering AIDS and Other Pandemics." The conference, attended by over 120 scientists, students, and citizens from France, West Germany, and the United States was held at the Société Immobilière du Corps médical français and was well attended by international press—including three U.S TV stations, ABC, CBS, and Worldwide TV News, the Italian agency ANSA, UPI, Radio France International, *Le Matin de Paris,* the weekly *Jeune Afrique,* and two medical papers, *Pratique Médicale Quotidienne* and *Impact Médecin*.

The conference was organized in four main panel sessions: I. Pasteur, His Method and his Scientific Roots; II. Optical Biophysics and the Concept of Negentropy; III. The Menace of AIDS: Biological, Economic, and Strategic Aspects; IV. A Biological Strategic Defense Initiative (BSDI): New Technologies to Conquer Disease.

In addition to the main conference panels, the conference had a beautifully-designed "Pedagogic Museum" on the contributions of Pasteur. A sampling of the exhibits presented in the museum included: an original oil painting portait of Pasteur as well as displays of the talented Pasteur's own paintings of his mother and father, done when he was a teenager; a polarimeter and accompanying crystal models through which the conference participants could "redo" Pasteur's principal experiments in molecular dissymmetry; a display of the geometric arrangement and color beam sequences of the Chartres Cathedral windows; a presentation on the contributions of the scientists of the Ecole Polytechnique to the modern understanding of polarized light and rotational action.

Christine Bierre of the French FEF opened the conference with greetings for best success from Jacques Chirac, the new prime minister of France and an ardent supporter of the Strategic Defense Initiative (SDI), and from Lyndon LaRouche, who called for the revival of the Pasteur method in science (see box).

Laurent Rosenfeld, president of the French FEF, then reminded the audience that 100 years ago, Pasteur made his famous speech announcing the success of his rabies vaccine and the creation of the Pasteur Institute. Noting the recent gift made by the Duchess of Windsor to the Pasteur Institute, Rosenfeld called for the creation today of an optical biophysics laboratory with those funds.

This writer had the honor of presenting the keynote address, an overview of Pasteur's scientific contributions, entitled: "Louis Pasteur, the Father of Geometric Optical Biophysics":

"The discovery and elaboration by Louis Pasteur (1822-1895) that *optical activity* is the unique geometric characteristic of living processes is the foundation upon which the modern scientific frontier variously known as *optical biophysics*, or *non-linear biological spectroscopy*, is based. Pasteur's method of *geometric biological spectroscopy*—most explicitly evident in his groundbreaking early studies on molecular dissymmetry and fermentation—stands in refreshing contrast to the otherwise completely pragmatic and reductionist orientation which is pervasive in biochemistry and molecular biology today. Pasteur traced his own heritage to the method of scientific hypothesis-formation associated with

the *constructive geometry* program of the 1794 Ecole Polytechnique of Gaspard Monge and Lazard Carnot and its scientific continuation into the 19th century through the Société D'Arcueil."

The next presentation was given by Dr. David from the Mérieux Institute, who described his work as the leader of a "Bioforce," a rapid deployment health strike force specifically designed to intervene in Third World countries. To avoid immediate biological catastrophe, the Bioforce intervenes in critical areas for rapid mass vaccinations, as in Peru now against rabies.

Closing the first morning session, Mr. Maurice Valery-Radot, who was educated by Pasteur's daughter, the historian Marie Louise, spoke on Pasteur as a politician. He particularly insisted upon the fact that Pasteur detested what today would be called liberalism, i.e., anarchic democracy, the worship of mediocrity. Pasteur demanded that anything not suspectible of precise scientific knowledge be excluded from the political domain.

On optical biophysics

The second panel opened with a speech by Dr. Jonathan Tennenbaum, European coordinator of the Fusion Energy Foundation, on Bernhard Riemann and the relevance of his groundbreaking work on geometry to the study of living phenomena. Dr. Tennenbaum situated the continuation of Riemann's work in the 20th century by the American economist Lyndon LaRouche, who developed the concept of "negentropy" based upon his studies of the scientific work of Riemann and Georg Cantor.

In the next presentation, Prof. Jean-Michel Dutuit, a paleontologist from the Paris Museum of Natural History, spoke on the theme of "the rise to power of the living process." Detuit stated that if we are to believe the most current notions, biological evolution would be a strange story, consisting of choices operated by successive ecologies over hundreds of millions of years—choices picked up amid innumerable solutions haphazardly "proposed" by living forms. The organophysiological mutations proposed by the living to the environment, thus, would not be correlated to the contemporary modifications of this environment.

To illustrate the problem with such a conception, Dutuit went back to the emergence of the very first germs of life, 3.5 to 4 billion years ago, the solar system and the Earth having appeared about 5 to 6 billion years ago. Photosynthetic bacteria appeared about 2.5 to 2 billion years ago; that is, unicellular beings with a primitive nucleus. Their existence is shown by the appearance, at that time, of organosedimentary formations called stromatolites. These stromatolites are considered the fossil evidence of photosynthetic microbial communities; they are additional witnesses to the existence of oxygen in a free state. After that, the Ediacar fauna (Australia), which dates from about 750 million years, seems to witness the existence of metazoans, of beings with several cells. Eukaryotes (cells with an advanced nucleus) could have appeared about 1 billion years ago. So, what is the lesson to be drawn from these historical elements?

Very early in its history, 2.5 billion years ago, life began to modify durably the Earth's crust. Next to the stromatolites, which represent the most direct witnesses of this remote history, the "Banded Iron Formations" (BIFs) are more indirect evidence of such production of oxygen by life. Photosynthesis rapidly gained such an importance that thick layers (the "red beds" of all ages) bear its signature. Thus, we have a sense of the enormity of the energy flux which goes through the process, even while only unicellular beings with a primitive nucleus exist on Earth.

Life must be seen as a "process in work"—process, in the sense that life is no mere succession or juxtaposition of animal and vegetal forms. Consequently, Professor Dutuit explained, the object of our reflection is the mode of growth of life conceived as a whole, capturing and transforming universal energy. So conceived, life corresponds to a change in metrics of universal evolution. Life is not juxtaposed, or opposed to the inanimate world, nor is it a parasite on that world, as other conceptions claim, but it represents the carrying out of the history of the inanimate world, through other more efficient means and the use of different laws.

Professor Dutuit then proposed an attempt to quantify the essential phase-changes in the evolution of the vertebrates. The first stage of reference taken is that of the most advanced fish, before they acquired carrying members. This was about 400 million years ago, and we talk here of an energy level of 1. Between the first level and the second level, a fundamental change in metrics occurs, with gravity intervening in the animal economy (amphibians appear). This goes back to about 300 million years ago. Amphibians, adapted to an Earthly mode of life, represent a change of at least a factor equal to 10 (gravity) multiplying the energy expenses linked to support and locomotion (in the water environment, gravity was balanced by the Archimedes force).

Level 3 encompasses two stages of organization between which one of the most fundamental changes in metrics has occurred: the transition to endothermy. This was about 200 million years ago. The first stage corresponds to the evolution of advanced reptiles toward the mammalian direction, and the second, with the transition to endothermy. The body temperature is now regulated at an optimum degree of functioning. Endothermy increases the possibilities of action upon the environment. It allows the conquest of all possible environments of life within a widespread thermic range. Increased possibilities of transformation of the universe mean, obviously, a strongly increased global energy "budget."

Level 4 corresponds to the mammalian organization. Finally, Level 5, which is the level of the emergence of hominids, corresponds to a new metric based on the acquisition of the tool—that is, thought of a reflective type, creative thought. The metric based on endothermy is inadequate to

appreciate the energy of the new system. It is physical economy, technology, which must serve as references. The time landmark for that is about 3 million years ago. There is no need to insist on the fact that growth is exponential.

Thus, the mode of regularly accelerated negentropic growth which is that of life, the growing intertwining of the coming into being of the organic and inorganic worlds, and more clearly, the relations of an economic sort between these two worlds, show that there exists between them two-way correlations, and that the programmatic transformations of life are not arbitrary. Life is not a blind process, no fatality weighs on it. It would be stupid and criminal if, now that it has become conscious with Man, evolution was being bent or reversed, whether the cause be a war, economic shortages, or a cocktail of viruses and bacteria, which would mean a rather rapid return to the origins.

Dr. Fritz Popp, from the Kaiserslaütern Technology Center, then spoke on the role of DNA in ultraweak photon emission of biological systems. Today, he said, it is an admitted fact that living systems emit a very weak photon radiation, that is called "low-level luminescence." The following characteristics of low-level luminescence have thus been demonstrated today, he said: 1) The intensity can go from several to a thousand photons per second and per square centimeter. 2) The spectral range spreads at least from infrared to ultraviolet. 3) Proliferating cell cultures radiate more intensively than those in which growth has stopped. 4) Dying cells show a relatively intense photon emission, regardless of the cause of death, such as refrigeration, heat, centrifugation, or treatment with toxic agents. 5) There are no known agents which do not influence the photon emission.

Dr. Popp and a group of researchers have worked out a model through which this "low-level luminescence" is explained in terms of a nonequilibrium phase transition including the possibility of a surprisingly high coherence of this radiation. And now, one essential question arises: Is the DNA the primary source of this low-level luminescence? This fantastic question, Dr. Popp, explained, has been the one which pushed him, back in 1972, to investigate further the field of low-level luminescence.

In 1980, researchers of the Max Planck Society in Germany came out with the notion that the source of the weak photon emission from living tissues could only be chromophores. But Dr. Popp believed just the opposite. If the ultraweak photon emission is assigned to a coherent electromagnetic field, which is the most fundamental communication basis for living tissues, then, the best candidate for its source would be the biomolecule with the highest potential information density, namely the DNA.

In conclusion, Dr. Popp said: 1) There is no doubt that ultraweak photon emission from biological systems is a sensitive indicator of biological states. 2) This photon emission originates probably from a delocalized coherent electromagnetic field within the cell population, working as a powerful information basis within and between the cells. And, 3) there are ample indications that the DNA forms the informational center of this field, both from the standpoint of potential information and from that of actual information. This field may work as the sensitive antenna to the external world as well.

On AIDS

The keynote speech of the Third Session was given by Dr. Mark Whiteside of the Tropical Institute of Medicine in Miami, Florida. Dr. Whiteside presented overwhelming evidence, utilizing the case of Belle Glade, for the fact that brutal economic collapse conditions, or environmental factors, are crucial to the uncontrolled propagation of AIDS in the tropical regions of the world. Following Whiteside, one of France's leading virologists, Dr. Fleury, presented the evidence that at least three new deadly diseases besides AIDS have broken out of animal reservoirs into man in Africa—the viral hemmoraghic fevers called Marburg Fever, Ebola Fever, and Lassa Fever.

To conclude the panel, Garance Phau presented the contributions of Pasteur's student, Charles Nicole, who was the founder of the Pasteur Institute in Tunisia and who had developed a theory of epidemics.

A tribute to Pasteur

These greetings came to the conference from Lyndon H. LaRouche, Jr., of Leesburg, Virginia.

It is widely known that I have a very special admiration for the memory of the great "Organizer of Victory," Lazare Carnot. Carnot and his collaborators saved France from the imminent defeat and dismemberment facing it in 1793, by accomplishing a revolution in military science within an astonishingly short period of time. This revolution was made possible by the collaboration between Carnot and the great Gaspard Monge, the founder and leader of the 1793-1814 period of the great Ecole Polytechnique. It is a little known, but important fact of modern science, that it was the collaborators of Carnot and Monge who prepared the ground for the revolution in physics accomplished by the collaborators of Alexander von Humboldt and the great Karl Gauss.

In the history of modern science as a whole, there are four great watersheds. Unfortunately, the debt of all modern science to the fundamental discoveries of Cardinal Nicolaus of Cusa, is little recognized today; but we do recognize the vast array of branches of science set into motion by such students of Cusa as Luca Pacioli and Leonardo da Vinci. The second great watershed, is the elaboration of the work of Leonardo and of Johannes Kep-

The BSDI

The final session of the Conference outlined the program of the Fusion Energy Foundation and *Executive Intelligence Review* for a Biological Strategic Defense Initiative (BSDI), and noted that recently Dr. Edward Teller of the United States had begun to discuss the need for a crash research effort to combat AIDS in the context of the SDI program.

Dr. Charles Gregg from Los Alamos, explained the significance of the CIDS machine (circular intensity differential scattering) and the potential for developing this work in optical biophysics, research in which Pasteur himself was the original pioneer. Gregg presented a description of CIDS and its more sophisticated successor, Multiparameter Light Scattering (MLS), from the historical, theoretical, and instrumental viewpoints. CIDS is a special case of the more general MLS technology. CIDS and MLS spectra for a variety of organisms and biological materials were selected from data taken in the Life Sciences Division of the Los Alamos National Laboratory, and in the laboratory of Mesa Diagnostics, Inc., and these methods for identifying micro-organisms were compared with other rapid identification methods. It is clear that more than supercoiling of DNA is involved in production of MLS spectra.

Another very efficient method of identifying closely related diseases was shown by Dr. James Frazer from the University of Texas, a pioneer in nuclear magnetic resonance (NMR). Frazer presented a history of basic biophysics research since the end of World War II.

The final presentation of the conference was given by Jacques Cheminade on the political relevance of Pasteur's life works for today's world. Cheminade also presented a resolution to the body which was unanimously endorsed: A declaration to Prime Minister Chirac calling upon France to defend Science in the face of the brutal irrationalist attacks on Science epitomized by the anti-nuclear energy terrorists in West Germany, the anti-space program propaganda in the U.S.A., and the attacks on basic biological research at the Pasteur Institute in France. What the anti-science Jacobin mob did to Lavoisier must not be repeated.

Another resolution, proposed by Cheminade, was also unanimously adopted. It called for the creation of a laboratory of optical biophysics at the Pasteur Institute, and a commitment to making groundbreaking discoveries within the 10 years leading up to the 1995 centennial of Louis Pasteur's death. This resolution received long and unanimous applause.

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ler by the great scientific enterprise organized by the great French minister Jean-Baptiste Colbert, the great contributions of such giants as Huyghens and Leibniz. The third great watershed, is the "crash program" in scientific and technological progress set into motion by Carnot, Monge, and their collaborators. The final great watershed of modern science, is centered around the collaboration between the circles of Carnot and Monge, and Humboldt and Gauss in Germany.

When we ask today, who in post-1815 France best represents the quality of the Ecole Polytechnique under Monge's leadership, there is no name which compares with that of the great Louis Pasteur. In every principal specialty, in physics, in chemistry, and in biology, the world is greatly indebted to this man of grand scientific optimism, this man of consummate scientific rigor.

Today, as optical biophysics promises, at last, to assume its proper leading position in the study of living processes, we are obliged more than ever to study afresh the mind of the great Louis Pasteur at work. Optical biophysics obliges us to look at the pioneering work of Pasteur with more profound insight than ever before. Not only do we do our moral duty to the living, to honor the great of the past; we learn valuable knowledge from Pasteur's work, as Huyghens, Leibniz, and Gauss learned from studying the incompleted projects of Leonardo and Kepler.

In modern times, pre-scientific education in secondary schools and university education, have come to depend excessively on the practice of substituting textbooks for the student's reliving of the work of the great discoverers from both the classical Greek period and those who contributed the crucial experimental insights supplied over the period from Nicolaus of Cusa through the greatest contributors of the nineteenth century. There is too much attention to the hindside of important discoveries from the past; there is too much plausible but mythological explanation of those discoveries, in texbooks and classrooms, and far, far too little reliving of the step by step process of rigorous inquiry by which the greatest of those discoveries were actually accomplished.

So, often, the work of Louis Pasteur, is explained too simply, with too little attention to the way in which he worked to effect his discoveries, too little attention to those matters which Pasteur explicitly pointed out as urgent work of his successors. Not only does Pasteur's memory benefit from such reflections; we, the living, and our posterity, will benefit in practical ways.

Not the least of the benefits, is the spiritual benefit to be gained. Let us uplift the spirits and talents of many among today's youth; let an accurate memory of the work of the great Pasteur inspire those youth to abandon cultural pessimism for scientific and cultural optimism. Let them understand, that scientific and cultural optimism have a sound practical foundation, only when the mind is disciplined by a rigorous scientific and moral conscience, as we see in the process by which the great Pasteur effected his great contributions.