

CHEMICAL HERITAGE FOUNDATION

JACQUES-EMILE DUBOIS

Transcript of an Interview
Conducted by

Colin B. Burke

at

Paris, France

on

21 January 2001

(With Subsequent Corrections and Additions)

CHEMICAL HERITAGE FOUNDATION
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JACQUES-EMILE DUBOIS

1920 Born in Lille, France on 20 April
2005 Died in Paris, France on 2 April

Education

1942-1943 École Nationale Supérieure de Chimie de Lille
1944 Bureau of Liberation Committee of the Isère region of France
1947 Ph.D., physical sciences, University of Grenoble
1948-1949 Ramsay Fellow, University College London
1956 Fulbright Smith-Mund Scholar, Columbia University, New York

Professional Experience

1948-1949 Scientific Advisor to the French Cultural Counselor, London, England

University of the Saarland, Saarbrücken, Germany
1949-1957 Professor of Physical Chemistry and Petrochemistry
1949-1957 Director of Chemistry Institute
1953-1957 Dean of Science Faculty
1957-1958 Guest Professor of Physical Chemistry

University of Paris, later Paris 7-Denis Diderot
1957-1988 Professor, Chair of Physical Organic Chemistry, later of Chemical Informatics

1961-1975 Board of Directors, Palais de la Decouverte, Paris, France
1962-1963 Scientific Advisor to the French Minister of Education, Paris, France
1963-1965 Joint Director of Higher Education in France
1963-1975 Member Directorate CNRS [Centre National de la Recherche Scientifique]
1965-1968 Board, French Chemical Society, Paris
1965-1977 Director of Research for the Ministry of Defense, Paris, France

1966-1980	Member, International CODATA Committee on Electrochemistry, Thermodynamics and Kinetics
1967-1997	Board of Directors, Institut de Biologie physico-chimique, Paris, France
1969-1977	Chair, IUPAC Interdivisional Committee on Machine Documentation
1972-1989	Vice President, National Centre for Chemical Information [CNIC], Paris, France
1972-1998	Founding President, Association for Research and Development in Chemical Informatics [ARDIC], Paris, France
	French Physical Chemistry Society, Paris, France
1972-1974	Vice-President
1974-1976	President
1977-1980	Co-Director, Curie Foundation, Paris, France
1977-1988	Founding Director, ITODYS [Institut de Topologie et Dynamique des Systèmes]
1978-1981	Director, French National University Agency for Scientific and Technical Documentation and Information [AUDIST], Paris, France
1979-1983	Scientific Director, Cie. Generale d'Electricité, Paris, France
1979-1983	Chief Executive Officer, Novelerg Co.
	CODATA, International Committee on Data for Science and Technology, Paris, France
1980-1988	French National Delegate, Vice-Chair, and Chair, Artificial Intelligence and Graphics Task Group
1980-1988	Vice-President, CODATA/ICSU
1994-1998	President
2000-2005	President, CODATA FRANCE
1993-2005	Vice-President, Center for Scientific Defense Studies, University of la-Vallée, Marne-la-Vallée, France

Honors

1946	Medaille de la Resistance, France
1948	Ancel Prize, French Chemical Society
1950	Stas Medal, Belgian Chemical Society
1953	Le Bel Prize, French Chemical Society
1954	Gold Medal, Society for the Encouragement of National Industry
1962	Commander of the Order of Merit of the Senegal
1962	Commander of the Order of Merit of the Ivory Coast
1965	Jecker Prize and Berthelot Medal, Academy of Sciences
1967	Commander des Palmes Academiques, France
1975	Commander of the German Order of Merit
1975	Grand Prix Technique for DARC System, City of Paris
1977	Commander Ordre National du Merite, France
1982	Bruylants Chair, Louvain University, Belgium
1986	Grand Prix of Graphic Animation du Festival d'Angers, Angers, France
1989	Commander Legion d'Honneur, France
1989	Dr. Honoris Causa, University of Regensburg, Germany
1991	C.A.O.C. [Correlation Analysis in Organic Chemistry] Medal, Paris
1992	Herman Skolnik Award for Chemical Information, American Chemical Society

ABSTRACT

Jacques-Emile Dubois begins the interview with a discussion of his family and early education. He discusses his paternal grandfather's and father's roles in World War I and his family's influence, his father's in particular, on his education. Dubois then details his experiences during World War II. He describes how he studied chemistry and medicine during the German invasion of France and elucidates his active roles in the French Resistance and in post-War French politics. Next, Dubois discusses how he came to be an essential figure in the creation of the University of Saarland. He details the reasons he accepted a professorship at the university and eventually the directorship of the Chemistry Institute. He also discusses his work at the University of Paris, which he did in parallel. Dubois then describes his work in the French Ministry of Education. He describes, in particular, the need for change in the French education system and his efforts to bring it about. He also talks about his role in the Centre National de la Recherche Scientifique [CNRS] and France's underdevelopment of instrument technologies at that time. Next, Dubois discusses his involvement in the creation of the chemical information system, DARC, and his important role in the Ministry of Defense. He describes how his fast kinetics research and his work at the defense ministry gave him an interest in computers and how that interest eventually led to his work in information systems. In addition, Dubois discusses his development of a topocoder instrument and his work on various information systems, including his cooperative efforts with the Chemical Abstracts Service [CAS]. He describes his work as head of IUPAC's [International Union of Pure and Applied Chemistry] Committee on Machine Documentation, the creation of CEDOCAR [Centre de Documentation de l'armement], and his creation of the Bureau of Scientific Information [BIS]. In conclusion, Dubois discusses the successes and failures of various information systems in France.

INTERVIEWER

Colin B. Burke had recently retired from the history department at the University of Maryland at Baltimore County and held a research fellowship at Yale University when he came to CHF. He spent his residency working on his book on the history of computer-based scientific information systems and related government policies, from the 1950s through the early 1990s. He received his Ph.D. from Washington University in St. Louis and currently serves as Associate Professor Emeritus at the University of Maryland. He also served as a Fulbright Scholar in Poland and as a Scholar-in-Residence at the National Security Agency.

TABLE OF CONTENTS

i-iii	Introduction by Bernice Dubois
1	Family History, Education, and World War II Description of father's World War I experiences. Influence of family on education. Effect of World War II on education. Working to earn his Ph.D. As a member of the French Resistance. Work in post-War French politics. Doing research in London.
7	The Ministry of Education Being offered a professorship to the University of the Saarland by Pierre Donzelot. Thoughts on teaching in German territory after the War. Becoming director of the Chemistry Institute and dean of science faculty. Becoming scientific advisor to Minister of Education. Working to change the French education system.
12	Computers and Information Systems Fast kinetics research. Working at the defense ministry. Early interest in computers. Studying hindered compounds and developing the chemistry information system DARC. Developing a topocoder and its limitations. Working with CAS and IUPAC on the Committee on Machine Documentation.
17	Work Within the DRME Creating the CEDOCAR. Working with the CODATA. Working with CAS to create applied databases in chemistry. Teaching the difference between information and informatics. Academic resistance to information scientists. The creation of AUDIST. As scientific director of the CGE.
22	Conclusion Attempts to advance the French library system. Creating EURECAS and linking it to CAS. Sending images and information through CODATA to the CODATA Conference in Kyoto, Japan. The successes and failures of various information systems in France.
27	Notes
28	Index

INTRODUCTION

By Bernice Dubois

What can I say? Let me start with the cornerstone. My husband had a deep and enduring love, indeed a passion, for chemistry. It was, to him, the foundation of all things living. “I have only one mistress” he used to joke “chemistry.”

Very early on, he was convinced that chemistry not only called for informatics but was uniquely ready for it, thanks to the structure of the Mendeleev Table. As he poetically expressed it in the title of a film: “Since the dawn of history, molecules were awaiting informatics.”

Although he will probably best be remembered for his DARC topological system, in the field of chemical information, his research also led to significant breakthroughs in such diverse areas as organic chemistry (beginning with his thesis on regio and stereoselectivity in ketolisation), reaction mechanisms, analytical chemistry, fast kinetics (including patented inventions like the TitraVIT in 1954, a polarovoltmeter for fast kinetic measurements with platinum electrodes, which Prolabo commercialized for decades), and surface phenomena.

This variety was emblematic of a mind that greatly valued cross-pollination. For instance, due to his keen interest in mathematics and physics, as well as in chemistry, the laboratories he directed, first in the Saarland and later in France, were multidisciplinary, with researchers from very diverse scientific backgrounds coming together. When responsible for defining policies for higher scientific education in France, he chose to create degrees in joint areas, structurally meshing organic and physical chemistry in ways that were new at the time.

He was a systemic and visionary thinker, combining to a rare degree creativity, analytical capability, and a gift for synthesis: he would approach concepts broadly, in a set theory mode, aware of their potential, before delving deeply and with sometimes maddening perfectionism into their component parts, exploring every potential ramification and application, all the while never losing sight of the whole.

At a time when they were not yet popular or recognized as promising, he had the pioneer's uncanny and sometimes stubborn sense for as yet largely untapped fields that would become critical to all in the future, such as informatics or surface phenomena.

In the early sixties, some of the young researchers he had oriented towards surface phenomena worried that they were struggling in the desert, but he remained confident, urging them to stay with it. In the same way, during the early years of his running the research and space programs department for the French Ministry of Defense, he hastened to launch and fund major programs in informatics and in the still burgeoning laser technology field.

A born teacher, he had the gift of rendering complex concepts clear and understandable and of communicating his enthusiasm to all, his synthetic mind excelling at painting the big picture

from the start, like a frame. “Simple, no?” “See how simple?” he would rejoice, with a twinkle in his eye. Over the years, many students and researchers testified to this gift.

On a completely different front, colleagues from different walks of life have commented on his remarkable ability as a manager in a variety of situations, for instance:

- directing a large university laboratory, the ITODYS, successfully engaged in pursuing quite different areas of research, with the usual scientific, human, organizational, and financial challenges implied
- balancing that task with modernizing the university system and research areas in France
- then, for some thirteen years, with running and modernizing the research and space programs for Defense in France

While eagerly embracing these responsibilities, and later others in the private sector or in the French health system, he steadfastly refused to give up his lab or his research. These always remained his life’s work and true “*raison d’etre*.”

How did he manage, you might ask, along with being a highly present husband and father?

One answer is certainly that he loved his work, and as he states in his oral biography, had a voracious appetite for it!

Another clearly lay in his organizational skills and leadership, his systems thinking or architect’s mind, if you will, enabling him to successfully pursue many interrelated strands.

He was also helped by an uncanny skill as a negotiator, due to a mix of determination, empathy, and creativity. He had to a rare degree what is called in French “*l’intelligence des hommes et des situations*.” That’s hard to translate, but basically means understanding and making the most of both the human element and the situation at hand. An ever ready, wonderful sense of humor at critical junctures didn’t hurt, lowering the tension for all involved.

*

* *

But beyond the scientific pioneering, the teaching, or the leadership, what he may be most remembered for by those who knew him best was his profound humanity and humanism.

If he was infinitely curious, ever eager to challenge any set ideas or habits of his own, he was equally passionate to transfer whatever knowledge and abilities he might have. And in so doing, he showed endless patience. Whether on a ski slope, swimming, discussing science, art, recipes, or a protégé’s education or career, he lived to pass on, to enrich and counsel those he met. Their problems or challenges swiftly became his own. He was the ultimate coach.

While deeply ethical and willing to make critical commitments in trying times, he knew no narrow boundaries or biases: just as, with a completely open mind, he believed one could learn from anyone, so was he ready to work with all and help anyone who wanted to build something worthwhile. For instance, while active in the French Resistance in World War II, he was

already truly European in spirit and understood the value of spending the next seven years of his career creating and directing a Franco-German university, drawing on the best aspects of both systems to make it work.

Throughout his life, he was highly interested in other cultures and people, eager to work on projects with colleagues from all over the world (the U.S., the U.K., Russia, the Ivory Coast, Senegal, Israel, China, Japan...to mention only a few). His friendships and interest extended well beyond science. I remember his returning from Japan in the late sixties fascinated by ideograms (with their curious kinship to the DARC concept), by the workmanship and the overall culture. One immediate consequence was a dramatic increase of fish in our family diet, as well as the habit of lunching at a Japanese restaurant every Sunday for many years thereafter! He took a similar interest in other countries, causes, and situations.

A recent essay about him was titled *A Man Without Boundaries*. In a way, that sums up what I am trying to express. There were no boundaries to his imagination, intellectual curiosity, love of science, joyful appetite for life, or to his deep involvement and caring for others. Only death set its boundary, a boundary that, to his very last days, he kept urging us to transcend, willing us not to be sad or regret the past, but to always look to the future.

I wish it were that easy.

Let me close by saying how happy he was to receive, shortly before passing away, *The History and Heritage of Scientific and Technological Information Systems: Proceedings of the 2002 Conference*¹, which featured his retrospective article on the DARC system. Even in those last moments, chemistry retained a beloved mistress's hold on his heart and mind.

¹ W. Boyd Rayward and Mary Ellen Bowden, eds, *The History and Heritage of Scientific and Technological Information Systems: Proceedings of the 2002 Conference* ASIS&T Monograph Series (Medford, New Jersey: Information Today, Inc., 2004).

NOTES

1. Robert Burns Woodward, "Structure and Absorption Spectra of α , β -Unsaturated Ketones," *J. Am. Chem. Soc.* 63 (1941): 3229-3230.
2. François de Closets, "La Chimie sur Ordinateur," *Science et Avenir*, no. 401 (July 1980).

INDEX

AACS. *See* American Chemical Society
American Chemical Society [ACS], 23
Angewandte Chemie, 16
Ashworth, Michael, 8
AUDIST. *See* University Agency of Scientific and Technical Information

B

Barthel, Josef, 9
Bauer, Edmond, 6
Beckman Instruments, Inc., 7
Bénard, Jacques, 17
Bibliothèque nationale de France, 21-22
BIS. *See* Bureau of Scientific Information
Bistesi, Jean, 4
Bouderlique, --, 3
Bureau of Scientific Information [BIS], 17-18

C

Cahn-Ingold-Prelog rules, 26
CAS. *See* Chemical Abstracts Service
CEDOCAR. *See* Centre de Documentation de l'Armement
Centre de Documentation de l'Armement [CEDOCAR], 18
Centre National de l'Information Chimique [CNIC], 22
Centre National de la Recherche Scientifique [CNRS], 4-5, 10-11, 19
CGE. *See* Compagnie Générale d'Electricité
Chemical Abstracts Service [CAS], 15-16, 19, 22, 24-26
CNIC. *See* Centre National de l'Information Chimique
CNRS. *See* Centre National de la Recherche Scientifique
CODATA. *See* Committee on Data for Science and Technology
Collège de France, 6
Committee on Data for Science and Technology [CODATA], 19, 21, 23, 26
 Seventh International Conference, 23
Compagnie Financière Alcatel, 22
Compagnie Générale d'Electricité [CGE], 22

D

DARC. *See* Documentation and Automated Retrieval of Correlations
Direction des Recherches et Moyens d'Essais [DRME], 17-18
Documentation, 19-20, 22-25
Documentation and Automated Retrieval of Correlations [DARC], 2,13,16-17, 21-26
Donzelot, Pierre, 7-8
DRME. *See* Direction des Recherches et Moyens d'Essais
Dubois, Jacques-Emile

- as scientific advisor to French cultural attache, 7
- assistant professorship in Grenoble, 6
- building international science, 21
- children, 14
- family business, 1
- father, 1, 3
 - as amateur painter, 2
 - business ventures, 1
 - foreign language skills, 1-2
 - prisoner of war, 1
- French Resistance member, 2-7, 10
- grandmother, 1
- interest in art, 2
- interest in history, 3
- interest in water polo, 2
- marriage, 8
- mother, 1
- paternal grandfather, 1
- personal determination, 24
- professorship at University of the Saarland, 7
- research philosophy, 11
- research work during World War II, 5
- scientific advisor to Minister of Education, 10
- spectroscopy studies, 7
- studies at University of Grenoble, 3
- studying hindered compounds, 14
- undergraduate interests, 3
- wife [Bernice Claire Shaaker Dubois], 9, 14
- World War II refugee, 3

Dupont, Pierre, 4

E

École Nationale Supérieure de Chimie de Lille, 3

Eigen, Manfred, 12

Eton College, 2

EURECAS. *See* European DARC version of Chemical Abstract Service

European DARC version of Chemical Abstract Service [EURECAS], 22-24

F

Fouchet, Christian, 9, 11

French Ministry of Defense, 13

French Ministry of Economy, Finance and Industry, 10

French Ministry of Education, 7, 19-21

French Resistance, 2-5, 7, 10

Freymann, Rene, 4-6

G

Gestapo, 2, 7
 crackdown in Grenoble, 3
Gosse, Rene, 4
Grenoble, University of, 3

H

Herman Skolnik Award, 23

I

ICSU . *See* International Council of Scientific Unions
Informatics, 9, 14, 20-21
Ingold, Christopher K., 6, 13
INPI . *See* Institut National de la Propriété Industrielle
Institut de Topologie et Dynamique des Systèmes [ITODYS], 12
Institut National de la Propriété Industrielle [INPI], 25
International Council of Scientific Unions [ICSU], 19
International Union of Pure and Applied Chemistry [IUPAC], 16-17
 Interdisciplinary Committee on Machine Documentation, 16
ITODYS. *See* Institut de Topologie et Dynamique des Systèmes
IUPAC. *See* International Union of Pure and Applied Chemistry

K

Kyoto, Japan, 23

L

Le Monde, 12
Les Laboratoires Servier, 12
Liberation Committee for the Northern Alps, 5
Livermore, California, 22
London, University College in, 6
Lycee, 2

M

Markush DARC, 25
Microsoft Corporation, 24
Ministry of Defense, 14, 17, 23
 missiles, 13
Minitel, 22-24
 "pink" Minitel, 24
Mountbatten-Windsor, Prince William Arthur Phillip Louis, 2

N

National Institute of Standards and Technology [NIST], 19
NATO. *See* North Atlantic Treaty Organization
NIST. *See* National Institute of Standards and Technology
North Atlantic Treaty Organization [NATO], 18

P

Personal computer [PC], 16, 24
Pétain, Henri-Philippe, 3

Q

Quentin de la Tour, Maurice, 2

S

Saarbrücken, Germany, 7, 9, 12, 14
Saarland, University of the, 2, 7, 9-10, 14
Saint-Quentin, France, 2
Seurat, Georges, 2
State University of Liège, 6

T

Telecommunications, 24
Topocodeur, 15-16, 19, 23
Topology, 12, 25

U

University Agency of Scientific and Technical Information [AUDIST], 21-22
University of Paris, 4, 6-7, 9, 11, 13

V

Viellard, Henri, 17
Vodar, Boris, 19

W

Woodward, Robert Burns, 14
World War I [WWI], 1
World War II, 3-5, 7, 10-12
 French “free” zone, 3
 French armistice [1940], 3
 French Resistance, 2-5, 7, 10
 Gestapo, 2, 7
 crackdown in Grenoble, 3