Division of History of Science and Technology,
International Union of History and Philosophy of Science

Renewing the Heritage of Chemistry in the 21st Century: Conversations on the Preservation, Presentation and Utilization of Sources, Sites and Artefacts

Paris, 21-24 June 2011

in Conjunction with the IUPAC-UNESCO International Year of Chemistry, 2011

Centenary of Marie Curie's Nobel Prize for Chemistry (1911)

École supérieure de physique et de chimie industrielles
(ESPCI ParisTech)
and
Maison de la Chimie

PROGRAMME AND ABSTRACTS

(Revised version)

International Year of CHEMISTRY 2011

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Organizing committee

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PROGRAMME

Tuesday 21 June

18.30-20.00. Reception at the Académie des sciences, Institut de France, 23 quai Conti, 75006 Paris

Welcome by Gérard Férey, member of the Institut de France, Académie des sciences

Address by Edmond Amouyal, Representative of the International Year of Chemistry, within the Ministère de l'enseignement supérieur et de la recherche

Presentation of the collected correspondence of Lavoisier by Patrice Bret, secretary of the Comité Lavoisier

Wednesday 22 June

École supérieure de physique et de chimie industrielles (ESPCI ParisTech), 10 rue Vauquelin, 75005 Paris

Plenary sessions between 9.00 and 10.15, 12.15 and 12.30, and between 18.00 and 18.30; parallel sessions between 10.35 and 12.05 and between 14.30 and 17.45.

Simultaneous translation will be available for the plenary lectures and all other sessions in Room A.

8.30. *Welcome – coffee*

9.00-9.15. ***Address***

François Lequeux, Directeur scientifique, ESPCI

9.15-9.30. ***Opening lecture***

Jeffrey Johnson, President of the Commission on the History of Modern Chemistry (CHMC)

9.30-10.15. ***Plenary lecture***

Chair: Gérard Emptoz

Valérie Marchal, Institut national pour la propriété industrielle (INPI), Paris

La numérisation des brevets français

10.15-10.35. *Coffee break*

10.35-12.05. ***Communication and documentation in chemistry***

Session 1A

Chair: Christoph Meinel

10.35. Jennifer Landry and Rosie D. Cook (USA), "More than black boxes. The instrument collection at the Chemical Heritage Foundation"

11.05. Susanne Rehn (Germany), "The new chemistry exhibition in the Deutsches Museum"

11.35. Isabel Martin (Germany), "A preview of the new chemistry exhibition at the Deutsches Museum. Polymer chemistry as a temporary exhibition"

Session 1B

Chair : Agustí Nieto-Galan

10.35. Bernadette Bensaude-Vincent, Emmanuel Bertrand, Sophie Jourdin, Sacha Loeve, and Pierre Teissier (France), " 'Sciences. Histoire orale'. A website for the history of recent science"

11.05. Ana Alfonso-Goldfarb, Marcia H. M. Ferraz, and Silvia Waisse (Brazil), "Digital media for the history of chemistry. Division of Multimedia Documentation at Center Simão Mathias (CESIMA)"

11.35. Masanori Kaji (Japan), "Establishment of chemical heritage in the first half of the XXth century. The role of Riko Majima, the leading first-generation organic chemist in Japan"

12.15-12.30. ***Special plenary session (Salle A)***

Philippe Garderet, Scientific Vice-President, AREVA :

Chemistry. A key technology for nuclear assembly

12.30-14.30. *Lunch at ESPCI ParisTech, sponsored by AREVA*

14.30-16.00. ***Historians and their sources***

Session 2A

Chair: Philippe Garderet

14.30. Glaucia Maria Da Silva, Léo Degrève, Felipe Conrado De Sousa, and Lucas R. Testa (Brazil), "Les archives de la Faculté de pharmacie et d'odontologie et l'histoire de l'enseignement de la chimie à Ribeirão Preto, Brésil"

15.00. Isabel Serra and Elisa Maia (Portugal), "Les archives Curie et la recherche sur la radioactivité au Portugal"

15.30. Denise Ogilvie (France), "Archives et laboratoires. Les sources de l'histoire de la chimie à l'Institut Pasteur. XX^{e} – XXI^{e} siècles"

Session 2B

Chair: Patrice Bret

14.30. Sara Carvalho, Maria Estela Jardim, and Ferdinanda Madalena Costa (Portugal), "Photography as chemical enquiry. The Lumière brothers' quest for organic developers"

15.00. Erik Langlinay (France), "The social history sources of French chemical history"

15.30. Seymour H. Mauskopf (USA), "Chemical landmarks and public understanding"

16.00-16.15. *Coffee break*

16.15-17.45

Session 3A ***Historians and their sources (continued)***

Chair: Robert Fox

16.15. Ad Maas (Netherlands), "The Unilever collection and the dilemmas of collecting modern chemical heritage"

16.45. Marco Taddia (Italie), "Ciamician's chemistry courses in Bologna (1889-1921). A selection of student lecture notes"

17.15. Alexandre Hocquet (France), "The Computational Chemistry List. Comprendre les chimistes computationnels à travers leurs échanges au sein d'une mailing list"

Session 3B ***Documentation, Evaluation and Re-use of Heritage Sites of the Chemical Industry*. TICCIH special session.**

Chair and introduction to the session: Helmuth Albrecht

16.15. Helmuth Albrecht and Stefanie Ullrich (Germany), "Documentation and evaluation of industrial heritage sites of the chemical industry in Saxony/Germany"

16.45. Randi Bårtvedt (Norway), "The re-use of an electrochemical plant in the Fjords of Norway"

17.15. Alexander Kierdorf (Germany), "Of white and black sides. Historic coke plants as monuments of science, technology, architecture, and environment in Germany"

17.45-18.00. *Break*

18.00-18.30. ***Public lecture***

Chair: Sylvain Gilat

Address to Gérard Férey by Jacques Prost, read by Bastien Fournié

Gérard Férey, membre de l'Institut de France, Académie des sciences,
Vice-président de la Société chimique de France, Médaille d'or CNRS 2010 :

Porous solids. From a mineralogical curiosity in 1756 to currently strategic materials

Thursday 23 June

At the Maison de la Chimie, 28 rue Saint-Dominique, 75007 Paris (Plenary sessions throughout the day). *Simultaneous translation will be available for the lectures and all other sessions, including the Round Table.*

8.45. Welcome

9.00-9.15. ***Address***

Jean-Bernard Borfiga, Vice-Président de la Fondation de la Maison de la Chimie

9.15-10.30. ***Plenary lectures***

Chair: Jeffrey A. Johnson

9.15-10.00.

Ronald Brashear, Othmer Library, Chemical Heritage Foundation, Philadelphia:

The Chemical Heritage Foundation.
An 'American model' of a multifunctional institution

10.00-10.30.

Robert Anderson, Clare Hall, University of Cambridge (UK):

Laboratories, generally considered

10.30-11.00. *Coffee break*

11.00-13.00.

Session 4 ***Institutions and the heritage of chemistry for historians***

Chair: Brigitte van Tiggelen

11.00. Francine Glière (France), "Les Archives départementales de la Savoie et le patrimoine industriel de la chimie'"

11.30. Gilles Chatry (France), "Conservation du patrimoine. La chimie en océanologie"

12.00. Patrick H. Shea (USA), "Science, technology, and the future of history"

12.30. Muriel Le Roux (UK & France), "La chimie contemporaine, une discipline sans histoire? Twentieth-century chemistry, a discipline without history ?"

13.00-14.45. *Lunch at the Maison de la Chimie*

14.45-16.15.

Session 5 ***Chemists and the general public***

Chair: Masanori Kaji

14.45. Robert Bud (UK), “Stories about chemistry. Illuminating folklore”

15.15. Elena Zaitseva (Russia), “The educational potential of historical artefacts related to chemistry”

15.45. Yasu Furukawa (Japan), “From chemistry to history. Chemist-historians and the Japanese Society for the History of Chemistry”

16.15-16.45. *Coffee break*

16.45-17.45. ***Round table***

Chair: Jeffrey Johnson

Access to sources and institutions: private policy, public policy

with contributions by Gildas Illien (Web Archives, BNF, France), Alexander L. Bieri (Hoffmann-LaRoche, Switzerland), and Hans-Hermann Pogarell (Bayer Archives, Germany)

18.00-18.30. ***Concluding plenary lecture***

Chair: Jeffrey A. Johnson

Carsten Reinhardt, University of Bielefeld (Germany):

A gaze at the spectrum of sources for the heritage of chemistry

20.00. Conference dinner (optional), sponsored by BASF France

Friday 24 June

Optional visits

INTRODUCTION

Renewing the Heritage of Chemistry in the 21st Century

Conversations on the Preservation, Presentation and Utilization of Sources, Sites and Artefacts

Introduction

In 2011, the International Year of Chemistry (IYC) decreed by the United Nations and organized under the auspices of IUPAC and UNESCO, we also celebrate the centennial of the award of the Nobel Prize in Chemistry to Marie Curie in 1911. That award stood at the beginning of a century of fundamental change in the nature of chemistry, which entailed such far-reaching transformations in scientific ideas and instruments, in technological applications and apparatus, in professional and disciplinary character, in geographic location and in institutional context, that those who applauded Curie's award in 1911 might scarcely recognize the chemistry of today in all of its manifestations. For two decades the Commission on the History of Modern Chemistry (CHMC) has, in a series of conferences and symposia, sought to foster a better understanding of these transformations. Thus it is appropriate that we take the occasion of the IYC to hold another symposium of this nature, and it is particularly appropriate that we do so in Paris, the scene of Marie Curie's scientific work. But whereas in past symposia we have primarily brought together chemists and historians, we are seeking this time to integrate a much broader group of specialists into our discussions: along with chemists and historians, the participants whose abstracts are collected here include experts in museum, archival, and library science, in computing technology, and in industrial archaeology. Often, indeed, the same person will have expertise in several of these fields. That is because the past and ongoing transformations of chemistry have created challenges of great complexity for those who seek to understand, preserve, and present, for specialists as well as for the general public, the heritage of chemistry in the 21st century. We believe that these challenges can only be properly met through the collaborative efforts of professionals in many disciplines. Hence the papers included in this symposium are a means to promote conversations among these experts, to the mutual benefit of all.

As previously outlined in our Call for Papers, we have entered an era in which new scientific ideas and new technologies have changed not only the face of chemistry itself, but also the nature of the sources for its future history. Along with the paper documents, oral histories, instruments, and other artefacts that have previously embodied the heritage of chemistry, we now need to include sources and artefacts of a different kind that represent the chemistry of the present and future, including electronic documents, images, videos, databases, software, and the hardware needed to preserve and use these sources. This has raised some difficult questions. How can the new technologies be best applied to preserve and enhance the use of older sources and artefacts as well as the new ones? How will historians need to adapt their methods of research to utilize these new technologies and sources, and how will the resulting changes affect the process of writing and publishing results, including electronic publications? How can archivists, librarians, and museum curators best obtain, preserve, and ensure their future accessibility to interested specialists? Besides the preservation and use of these materials, historians must also be increasingly

concerned with the preservation of key sites associated with the heritage of chemistry, including academic and industrial research laboratories as well as centres of technological innovation, because the historical development of scientific and technological innovations may often be most clearly understood by seeing the original apparatus and equipment in their original settings. This raises the further question: how can the specialists and institutions concerned with the heritage of modern chemistry, including industrial archaeologists, best present critical sources, sites, and artefacts to the general public, in ways that will highlight key developments and avoid misconceptions?

The abstracts included here offer a variety of perspectives on these questions. The authors come from many countries on four different continents, reflecting the global scope of modern chemistry. We have eminent academic scientists and historians, but also representatives of many of the foremost institutions at work in preserving the heritage of chemistry today – public and private museums, archives, libraries, and sites of industrial archaeology. Half of the authors are women, a fact of which we believe Marie Curie would have been proud, in view of the many difficulties confronting women scientists in her day. The speakers and subjects of the plenary lectures give an idea of the scope of the symposium: Valérie Marchal of the INPI, Paris, discusses the creation of an electronic database of patents; Ronald Brashear, the Arnold Thackray Director of the Othmer Library, Chemical Heritage Foundation (CHF), Philadelphia (USA), describes the "American model" represented by the CHF; Robert G. W. Anderson of Cambridge University (UK) and current chairman of the Society for the History of Alchemy and Chemistry, considers chemical laboratories in general; and finally Carsten Reinhardt of the University of Bielefeld (Germany) and current Head of the Working Party for the History of Chemistry, European Association for Chemical and Molecular Sciences, examines the spectrum of sources for the heritage of chemistry. We are also honoured to have a distinguished public lecturer, Gérard Férey, member of the Institut de France, Académie des sciences, Vice-President of the Société chimique de France, recipient of the Gold Medal of the CNRS in 2010, to speak on "Porous solids: From a mineralogical curiosity in 1756 to currently strategic materials". We are very grateful to all of these distinguished colleagues for their willingness to share their insights with us.

In addition to the plenary lectures, the many individual scientific papers in the various sessions of the symposium address an equally wide range of questions and issues, as shown in the abstracts. Our speakers on museums, archives, and historical sites include: on museum exhibits on chemistry and the history of chemistry, Ad Maas of the Boerhaave Museum in Leiden (NL), Jennifer Landry and Rosie D. Cook of the Chemical Heritage Foundation (USA), and Susanne Rehn and Isabel Martin of the Deutsches Museum in Munich (Germany). On archives relevant to the heritage of chemistry, Glaucia Maria Da Silva and her colleagues discuss a Brazilian university faculty; Isabel Serra and Elisa Maia speak on the Archives Curie and radioactivity research in Portugal. Denise Ogilvie examines archival sources for the history of laboratory research in chemistry at the Institut Pasteur in Paris. Erik Langlinay will consider problems related to locating and preserving sources in local archives for the social history of industrial chemistry (strikes and accidents). Gilles Chatry discusses issues related to the collections of the recently organized archives of Ifremer (the French

institute for research on the oceans), and Francine Glière reviews the sources for the heritage of chemistry in the departmental archives of Savoy (France). On heritage sites in Germany and Norway, approached from the perspective of industrial archaeology, we have a special session organized by Helmuth Albrecht of TICCIH, The International Committee for the Conservation of the Industrial Heritage, with his colleagues Stefanie Ullrich, Randi Bårtvedt, and Alexander Kierdorf. On heritage sites in the United States, Seymour H. Mauskopf has a paper on the American Chemical Society's National Chemical Landmarks Program.

We have a range of stimulating contributions on the sources and methodologies for documenting the heritage of modern chemistry. Some of the presentations also reveal the rather daunting tasks that confront contemporary historians and archivists in this field. On oral history we have Bernadette Bensaude-Vincent, Sophie Jourdin, and their colleagues presenting a new website "Sciences, Histoire Orale", hosted by one of our main sponsors, ESPCI ParisTech. Several other speakers will present talks touching on various types of documentary sources, old and new: Marco Taddia on student lecture notes (in this case, for Giacomo Ciamician of Bologna, Italy), Masanori Kaji on scientific diaries (specifically those of Riko Majima, Japan's leading first-generation organic chemist), and Alexandre Hocquet on an electronic mailing list (the computational chemistry list). Sara Carvalho and her Portuguese colleagues discuss sources for the chemical history of photography (in the notes and publications of the Lumière brothers), and Ana Alfonso-Goldfarb, Márcia Ferraz, and Silvia Waisse discuss digital media for the history of chemistry (based on their data at the Brazilian Center Simão Mathias, CESIMA). From differing perspectives, two speakers illuminate the challenges confronting those who seek to preserve sources for the heritage of contemporary chemistry in general: Patrick Shea, the chief archivist of CHF, surveys the range of problems arising from the exponentially increasing scale and complexity of contemporary chemical data, which require fundamentally new approaches centred on electronic data technologies, as well as much closer cooperation among archivists, historians, scientists, and technical experts; Muriel Le Roux draws from case studies of academic-industrial interactions in the development of medications at the end of the 20th century to advocate a global approach to the preservation of sources, some of which may otherwise become so elusive that contemporary chemistry could become "a discipline without a history."

Finally, on the heritage of chemistry in its relation to the general public and to the education of chemists, Robert Bud of the Science Museum in London presents a British perspective on the challenge of dealing with scientific "folklore" (oft-told anecdotes that may lack historical foundation) in presenting the heritage of chemistry in a museum setting. Elena Zaitseva considers the use of historical artefacts in chemical education from a Russian perspective, and Yasu Furukawa speaks on chemists as historians and history in chemical education (with specific reference to the Japanese Society for the History of Chemistry, of which he is the current president).

We would also like to mention here the Round Table Discussion, “Access to sources and institutions: private policy, public policy”, taking place on the afternoon of Thursday 23 June. The participants include Alexander L. Bieri, curator of the Hoffmann-La Roche Collection and Archives in Bâle (Switzerland) and Hans-Hermann Pogarell of the Bayer Archives in Leverkusen (Germany), both of whom represent distinguished archives in the chemical and pharmaceutical industries. Alexander Bieri also represents the Arbeitskreis Chemiearchivare der Vereinigung deutscher Wirtschaftsarchivare (Working Group of Chemistry Archivists of the Association of German Economic Archivists). A third participant is Gildas Illien who is responsible for developing the Web Archives of the Bibliothèque nationale de France. We have not requested abstracts from the participants in this session, because it has been designed to be a conversation rather than a series of talks, but their comparative perspectives on public and private (or industrial) archives, and questions relating to access and use, are nevertheless of considerable interest for the theme of the symposium as a whole.

In closing this introduction we would also like to take the opportunity to express our thanks to the many sponsors who have made this symposium possible: IUPAC (International Union for Pure and Applied Chemistry), which has designated our symposium an official event of the International Year of Chemistry; the Comité Ambition Chimie (France), which has similarly recognized our symposium as part of the French events in the International Year of Chemistry; and the Division of History of Science and Technology of the International Union of History and Philosophy of Science, the parent organization of CHMC. The Académie des sciences de l’Institut de France, the École supérieure de physique et de chimie industrielles (ESPCI ParisTech), and the Fondation internationale de la Maison de la Chimie in Paris, have all graciously made their facilities available for our meetings. We are also extremely grateful to two ministries of the French government, the Ministère de l’enseignement supérieur et de la recherche (MESR), and the Ministère de la culture et de la communication (Délégation générale à la langue française et aux langues de France). The latter made it possible to provide facilities for the simultaneous French-English translation of the plenary lectures and the majority of the sessions. Finally, we thank the many organizations that have generously provided support in various ways, including the Société Chimique de France (SCF), the Centre national de la Recherche scientifique (CNRS), the Chemical Heritage Foundation (CHF), the AREVA Group, the ARKEMA Company, BASF France (the principal French affiliate of the BASF group in France),
the Comité national français d’histoire et de philosophie des sciences (CNFHPS) and the Comité national de chimie, both associated with the Académie des sciences, Paris; the Groupe d’histoire et de diffusion des sciences d’Orsay (GHDSO), Université Paris-Sud 11, Orsay; the Société d’encouragement pour l’industrie nationale (SEIN), Paris; the European Society for the History of Science (ESHS); and the European Association for Chemical and Molecular Sciences (EuCheMS). We would like to give special acknowledgment to the Club d’histoire de la chimie, the specialty group for history of chemistry within the SCF, whose members have played a central role in making the local arrangements for the symposium.

We are grateful to all of these institutions and their leaders for their kind support, as we are also grateful to our colleagues for their work on the programme and French organizing committees, and above all to our participants for their stimulating contributions toward the interdisciplinary conversations that are the goal of this symposium.

Jeffrey Allan Johnson (President, CHMC),
Robert Fox (Chair, Programme Committee),
Danielle Fauque (Chair, French Organizing Committee)

PLENARY LECTURES

LA NUMÉRISATION DES BREVETS FRANÇAIS

Valérie Marchal
INPI, Paris

Les dossiers de brevets sont conservés aujourd'hui par l'INPI, héritier des institutions en charge des brevets d'invention depuis les premières lois des 7 janvier et 25 mai 1791, créant ce type de protection en France.

Ils forment un fonds de près de 400 000 dossiers de 1791 à 1902, constitués d'un mémoire descriptif, dans lequel le déposant explique de façon détaillée les principes, moyens et procédés qui forment son invention, de diverses correspondances, de dessins (plans, coupes et élévations), quelquefois même d'échantillons, notamment pour les papiers peints, tissus, etc. La plupart de ces documents sont manuscrits, à l'exception du certificat de délivrance pré-imprimé qui apparaît dans les années 1820. Le cœur du dossier réside dans le mémoire de l'inventeur, parfois réduit à une page, parfois composé de cahiers entiers rédigés par les déposants eux-mêmes. Ce fonds est particulièrement riche grâce à la correspondance qui complète les dossiers, relatant les échanges entre les inventeurs et le ministère, avant la délivrance officielle du brevet.

Ces documents émanent donc directement des acteurs de la création technique (ingénieurs, mécaniciens, industriels, divers créateurs et artisans), et retracent deux siècles d'innovation et d'histoire industrielle. Ils constituent à présent un fonds vivant, bientôt accessible au grand public via la base de données des « brevets 19^{e} siècle ». En effet tous les dossiers originaux des brevets d'invention déposés, intégralement numérisés, seront mis en ligne sur Internet depuis 1791 jusqu'à l'année 1902.

THE CHEMICAL HERITAGE FOUNDATION: AN 'AMERICAN MODEL' OF A MULTIFUNCTIONAL INSTITUTION

Ronald S. Brashear
Chemical Heritage Foundation, Philadelphia, USA

The Chemical Heritage Foundation (CHF) was established as the Center for History of Chemistry (CHOC) in 1982 in Philadelphia, with a mission to discover and disseminate information and historical resources pertaining to chemistry and to encourage research, scholarship, and popular writing in the history of chemistry, chemical engineering, and the chemical process industries. The original concept of CHOC was to be a clearing house that would undertake oral histories, locate important archives and encourage their processing and deposit in appropriate repositories, and to make known the achievements of chemists and the chemical industry. CHOC was not originally designed as a place that would actually have a major historical collection of its own. This paper will demonstrate how the original vision for CHOC was soon replaced with a need to build a historical collection and how that effort transformed what would become CHF from a scientific society-based clearing house about history into a leading

research library, humanities research center, and exhibition gallery concentrating on the history of science, technology, medicine, and industry with an emphasis on chemistry and chemical engineering. This change came about through the transformative gifts of entrepreneurs, a growing need for support for academic research in the scientific and technological humanities, and a sense that fewer and fewer institutions were actively building collections that encompassed the full material and intellectual history of chemistry and related fields. I will also discuss the challenges and outcomes that resulted from an early sense of excitement that one institution could do it all to a more realistic vision of building a professional collecting institution with practical limitations on what it can collect. The niche that CHF may find best-suited for its new mission is that of the American independent research library of primary source material and historical artifacts.

LABORATORIES, GENERALLY CONSIDERED

Robert G. W. Anderson
Clare Hall, University of Cambridge, UK

Laboratories play a major role in the conduct of experimental science. They are the most obvious external physical symbol of scientific endeavour. Yet their study up to now has been patchy. They do not feature as one of the seventeen categories of Nikolaus Pevsner's building types (though museums and hospitals do) (1). What does exist in the literature is more to do with the contents of laboratories, and their social organisation. Most work in the history of science uses as evidence only what the scientists themselves have published about their procedures: a broader view should be sought (2).

It might bring significant benefit to history of science studies if laboratories were considered systematically. First of all, what are they? Would definitional boundaries be helpful? Can laboratories be treated as a homogeneous building type? Which emerged for very specific purposes, and which for more general usage? How do the research laboratory, the laboratory for routine investigations (including the industrial laboratory), the teaching laboratory, and the demonstration lecture theatre differ? (3). There is the question of structure and design. How were laboratories created, and how were decisions taken about what was to be provided? Who were their architects? How did they evolve and how were existing buildings adapted to changing needs? To what extent did the means of funding them influence their outcome? Are there national styles of laboratories? Were they simply places in which to pursue science, or were there also symbolic aspects?

How might we study laboratories? (4). What evidence needs to be sought? In developing an approach, should archaeologists and architectural historians be involved? Many key examples have been destroyed: to what extent could building preservation laws be used to cover the case of laboratories? There are more questions here than can be even sketchily considered in the course of a brief paper, but it would be valuable to generate a discussion as to whether this is a subject which could become the basis of a research programme.

(1). Nikolaus Pevsner, *A History of Building Types* (London: Thames and Hudson, 1976).

(2). Scientists, in their research publications, rarely say much about the facility in which they work (or even the instrumentation by which they obtained their data). It may be necessary to turn to the publications of others for evidence. In her recent PhD thesis, Catherine Jackson considers 19th-century organic chemistry laboratories in Germany, and has identified some of these other sources; see chapter five of her 'Analysis and Synthesis in Nineteenth-Century Organic Chemistry', unpublished PhD dissertation, University of London (2008).

(3). I have brought up some of these issues in 'The Creation of the Chemistry Teaching Laboratory'; see Marta C Lorenço and Ana Carneiro (eds) *Spaces and Collections in the History of Science* (Lisbon: Museum of the History of Science of the University of Lisbon, 2009), pp.13-23.

(4). There have been studies of specific cases, e.g. the Edinburgh laboratories in my *The Playfair Collection and the Teaching of Chemistry…* (Edinburgh: Royal Scottish Museum, 1978). But the point of this proposal is that a general approach should be developed.

A GAZE AT THE SPECTRUM OF SOURCES FOR THE HERITAGE OF CHEMISTRY

Carsten Reinhardt
University of Bielefeld, Germany

Nowadays, historians of chemistry have access to a huge variety of sources. The range covers research data and compound samples; instruments and glassware; texts and visual representations; theater plays and movies; and architectural sites and monuments. Sources are even produced by the historian through interviews, and scientists get in immediate touch with history in writing it themselves. However, with almost everything in chemistry potentially being a source for the historian's gaze, we are in danger of losing sight of the context in focussing on the particular. Moreover, with the growth of the scientific enterprise, and new media providing access to raw data in formerly unimaginable quantities and forms, historians of recent chemistry face information overload. In my talk, I will inquire into some possibilities to make sense of the spectrum of sources, including interpretation methods for tracking down the more elusive and ephemeral parts of chemistry. How do we understand the chemist's sense of smell? Can we get access to the emotional sides of doing chemistry? Most important, however, are our efforts to reconstruct the network of scientific activities and structures from a spectrum of sources, which represent our sole traces to the past.

PUBLIC LECTURE

POROUS SOLIDS. FROM A MINERALOGICAL CURIOSITY IN 1756 TO CURRENTLY STRATEGIC MATERIALS

Gérard Férey
Institut Lavoisier (CNRS 8180), University of Versailles, France

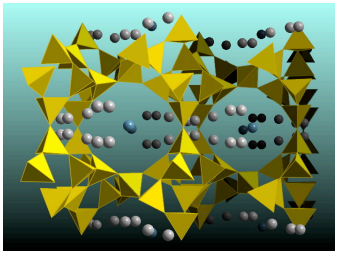
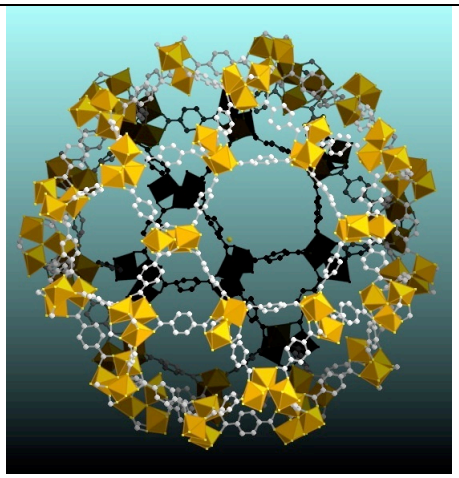
Porous solids are products which contain, at the atomic scale, cavities (cages, tunnels) regularly arranged in the three dimensions of space.

The first evidence for them occurred in Sweden in 1756. The mineralogist Axel-Friedrich Crönstedt, examining the thermal behaviour of the mineral stilbite, a calcium and sodium aluminosilicate, observed that, above 100°C, bubbles appeared on the surface of the stone. This unprecedented behaviour, sometimes further encountered for other minerals led him to name this new family zeolites (the boiling stones, (from greek ζειν (zein): to boil and λιθος and (lithos): stone). The first applications began to appear before the discovery of the first synthetic zeolite called levynite in 1862 by Henri Sainte-Claire Deville, using hydrothermal methods. The structural explanation of the behaviour was provided only in 1930 simultaneously by Pauling and Taylor, with the existence of small pores appearing in the interstices of the atomic arrangement. This property was immediately exploited in the petroleum industry for cracking of oils, gas separation and catalysis, and now, the applications of porous solids represent, directly or indirectly almost 20% of the Gross Domestic Product of industrial countries.

The lecture will present in a first step the evolution of the chemical ways of synthesis which aimed at increasing the size of the pores for different applications. The diameter of the cavities can now lie in the range 1-50 nm, and allows to classify the solids in two sub-classes: nanoporous solids if the diameter is < 2 nm, and mesoporous above.

The second part of the lecture will be devoted to the everyday increase of applications which concern, beside the classical ones cited above, those interesting the domains of energy (hydrogen storage, fuel cells), of energy savings (new catalysts and gas separation operating at room temperature), of environment with the capture of greenhouse gases at 25°C, and more recently health with the discovery of porous solids acting as efficient nanocarriers for the storage and delivery of antitumoral and anti-retroviral drugs against AIDS and various types of cancer.

Some references :
G. Férey and al., *Angew. Chem. Int. Ed.,* **1999**, *38*, 3268
G. Férey, *Chem. Soc. Rev.,* **2008**, *37*, 191

	
Inorganic nanoporous solid: mineral Stilbite	*Hybrid mesoporous solid: MIL-101*

Welcome: Jacques Prost, Director of the ESPCI, address read by Bastien Fournié (129th promotion), President of the Bureau des élèves

Chair: Sylvain Gilat, Director of communication (ESPCI)

SESSIONS

SESSION 1A

Communication and documentation in chemistry

MORE THAN BLACK BOXES. THE INSTRUMENT COLLECTION AT THE CHEMICAL HERITAGE FOUNDATION

Jennifer S. Landry & Rosie D. Cook
Chemical Heritage Foundation, Philadelphia, USA

In October 2008, the Chemical Heritage Foundation (CHF) opened its newly constructed museum devoted to the history of chemistry. The exhibition provided the first opportunity for CHF to look critically at its artefact collections and think about how its significant collection of electronic-era instrumentation would be interpreted and understood by curators, museum visitors, and researchers. The planning process and resulting exhibition revealed the importance of collecting and documenting more than just the "black box". In order for the artefacts to have relevance to the general public as well as scholarly research value, we needed to collect complementary materials that helped communicate the human stories and provide context to the artefacts. Fortunately, the collections at CHF already contained extensive archives, oral histories, photographs, and manuals for many of the artefacts that helped the curators tell engaging stories. The process also reinforced the fact that future instrument and artefact collecting needed to purposely consider and include materials that provided context and meaning to the artefacts.

This paper will discuss the more comprehensive approach to collecting that has developed in the last two years to expand the artefact collection and supporting materials. Through the collection of trade literature, instrument manuals, images, and archives CHF is actively working to document and provide a more complete picture of the instruments and their provenance. The opening of the museum and our desire to provide rich scholarly resources has also led us to re-evaluate our overall collecting scope and how we want to approach the collection of more recent artefacts. The paper will also discuss a CHF program called *Instrumental Lives* which seeks to film key figures in instrumentation history interacting with the instruments and talking candidly on camera about the development of the instruments, how they worked (or did not), and describing daily laboratory life.

THE NEW CHEMISTRY EXHIBITION IN THE DEUTSCHES MUSEUM

Susanne Rehn
Deutsches Museum, Munich, Germany

Ever since the first exhibitions in 1906, chemistry has been present in the Deutsches Museum. After nearly forty years, the chemistry exhibition is currently being rebuilt. The title of the new exhibition is “Surprising Chemistry in Everyday Life”. We want to show chemical phenomena that occur around us every day, in different areas like “sports and fashion”, “nutrition”, or “analytical chemistry”. At the same time, the exhibition highlights modern chemistry as a responsible, innovative science.

In the wake of the new exhibition, the chemical collection was digitized. We worked on approximately four thousand objects that are stored on the museum island plus an additional five hundred objects, which used to be displayed in the old exhibition, now closed. These objects were photographed, measured and the data put into a database. This work is, of course, not complete; future projects will deal with the documentation of the whole collection, especially the reconstruction of destroyed objects. The chemical collection features a variety of historical chemical samples, e.g. we have a sample of almost every chemical element in the periodic table. These chemicals must be labeled and stored in accordance with modern standards. The collection also contains historically significant pieces, such as virtually the entire equipment that Justus von Liebig used in his Munich laboratory, glassware from the 17th and 18th centuries, the original instruments with which Otto Hahn and his colleagues Lisa Meitner and Fritz Strassmann discovered nuclear fission, and a large number of historically very important laboratory devices. The latter, in particular, are often only fragmentary, so that much work remains to be done in the task of reconstruction.

Publication

Andrea Funck, Susanne Rehn, “Ein neues Konzept für die ‘Wissenschaftliche Chemie’ im Deutschen Museum”, *Restauro*, 6 (2008), 380-9.

Susanne Rehn, Christine Kolczewski, “Chemie ist Alltag”, *Kultur und Technik*, 3 (2009), 18-23.

A PREVIEW OF THE NEW CHEMISTRY EXHIBITION AT THE DEUTSCHES MUSEUM POLYMER CHEMISTRY AS A TEMPORARY EXHIBITION

Isabel Martin
Deutsches Museum, Munich, Germany

The chemistry exhibition has always been an integral part of the collections at Deutsches Museum and has been subject to many changes within the last century. The last chemistry exhibition was opened in 1972 and is currently closed for rebuilding.

On the occasion of the International Year of Chemistry we will inaugurate a temporary chemistry exhibition in autumn 2011. This exhibition will be a preview of the new permanent chemistry exhibition, which is in construction at the moment. In this exhibition the content will be presented on cylindrical areas that are enclosed by a structured membrane representing an abstract microstructure corresponding to the respective topic.

For the temporary exhibition, the subject of polymer chemistry was chosen. Polymers play an important role in everyday life. Especially in the fields of sport and fashion, a world without polymers is barely conceivable. This context will be used to arouse the visitors' curiosity and to give them surprising insights into how plastics are used and what chemistry is at work in the background.

The visitors will learn e.g. about polymer foams that are used as shock-absorbing material in bicycle helmets or about functional textiles and how their chemical structure is responsible for their waterproof but breathable properties. The explanations will be supported by interactive demonstrations and media. For example, a bicycle helmet crash test can be performed to demonstrate the protective effect of such a helmet.

Also the history of polymer chemistry will be illustrated through the examples of bakelite and nylon. Corresponding artefacts from the large collections of the Deutsches Museum will be presented.

In the exhibition, chemistry is presented as an innovative science. But we would also like to emphasize that it is a responsible discipline. The exhibition aims to show that in everyday life surprising chemistry happens all the time.

SESSION 1B

Communication and documentation in chemistry

SCIENCES, HISTOIRE ORALE: A WEBSITE FOR THE HISTORY OF RECENT SCIENCES

Bernadette Bensaude-Vincent
Cetcopra, Université Paris 1 – Panthéon-Sorbonne, Paris, France

Emanuel Bertrand
Pecsa, ESPCI ParisTech, Paris France

Sophie Jourdin
Centre François Viète, Université de Nantes, Nantes, France

Sacha Loeve
Cetcopra, Université Paris 1 – Panthéon-Sorbonne Paris, France

Pierre Teissier
Centre François Viète, Université de Nantes, Nantes, France

Our paper presents a new website *Sciences, Histoire Orale* [Sciences, Oral History] that results from a collective project over several years. This website, which is hosted by ESPCI ParisTech, displays a collection of transcribed interviews with scientists started in 2000. The set of texts, images, and sounds that is available through the site is made up of two different databases. The first comes from a previous MIT program launched by Sloan Foundation and Dibner Funds (2000-2006) under the responsibility of Bernadette Bensaude-Vincent. It gathers around fifty interviews of materials scientists in English. The second is devoted to interviews led in France by young researchers who study the history of contemporary sciences: solid state chemistry, catalysis, nanotechnologies, biotechnologies… This second database is continually growing.

While demonstrating the (easy) browsing through the website, we will underline five striking features of this digital tool: 1°) its novelty, since, as far as we know, the thematic organization we have adopted is new in the history of science; 2°) its historical interest, since it makes available to academic and lay people a vast set of oral sources; 3°) its interdisciplinary vocation as an interface between historians, philosophers, and scientists; 4°) its heritage dimension as a place for the preservation of individual testimonies, scientific cultures, and collective memory of the twentieth century; 5°) its basis for a historiographical reflection on the problematic nature of oral sources, between memory and history, between collections and testimonies, which appear like interstitial objects carrying invaluable as well as ambiguous information.

DIGITAL MEDIA FOR THE HISTORY OF CHEMISTRY: DIVISION OF MULTIMEDIA DOCUMENTATION AT THE CENTER SIMÃO MATHIAS (CESIMA)

Ana M. Alfonso-Goldfarb & Márcia H.M. Ferraz & **Silvia Waisse**
(CESIMA), Pontifical Catholic University of São Paulo (PUC-SP), Brazil

The Center Simão Mathias for Studies in the History of Science (CESIMA) was founded in 1994 as one of the first Latin-American centers specializing in the history of science. One of the main motives for its foundation was the need to have easy access to the required sources, which could only be supplied in digital format.

Hence for more than 15 years CESIMA has been building a digital library to be made available online, which currently comprises about 30,000 primary documents. The lion's share of CESIMA's collection is represented by sources for the history of chemistry, from remotest antiquity to modern times, including rare and ancient books as well as manuscripts and iconography. The reason is that the main research line at CESIMA is the history of theories of matter, through an interdisciplinary approach embracing chemistry, alchemy, physics, mineralogy and metallurgy, pharmacy, materia medica, and the sciences of living matter. Documents were acquired mostly as microforms and were digitalized at CESIMA, first through an *ad hoc* system developed by CESIMA researchers (since at the beginning no suitable technology existed), and later by employing state-of-the-art technology.

After solving the problem of the preservation and storage of documents, our current concern is to develop classification criteria appropriate for the specific case of the history of science, in particular, the history of the sciences of matter. No single current scheme of classification of the sciences/areas of knowledge can be accurately applied to the history of science, since they do not extend to outdated fields of scientific activity, such as natural history and alchemy, so making it very difficult for researchers to locate and retrieve the relevant sources.

Funded by the major Brazilian agencies for the endowment of the sciences (FAPESP, CNPQ) and with an extensive network of partnerships with major specialized centers worldwide, CESIMA's is a successful model for the ongoing and forthcoming digital era.

Publications

Alfonso-Goldfarb, A.M., & M.H. Ferraz. "*Gur*, *Ghur*, *Guhr* or *Bur?* The Quest for a Metalliferous Prime Matter in Early Modern Times", *British Journal for the History of Science*. [forthcoming]

Alfonso-Goldfarb, A.M., M.H. Ferraz, & P. Rattansi. "Lost Royal Society documents on 'alkahest' (universal solvent) rediscovered", *Notes and Records of the Royal Society,* 64 (2010) 435-56.

Alfonso-Goldfarb, A.M., M.H. Ferraz, & S. Waisse. "Balsams in the 18th Century: A Modern Experimental Approach", *Annals of the History and Philosophy of Biology*. Special Issue, edited by Brigitte Hoppe and Nicolas Robin [forthcoming].

THE ESTABLISHMENT OF CHEMICAL HERITAGE IN THE FIRST HALF OF THE 20TH CENTURY IN JAPAN

THE ROLE OF RIKO MAJIMA, THE LEADING FIRST GENERATION ORGANIC CHEMIST IN JAPAN

Masanori KAJI
Tokyo Institute of Technology, Tokyo, Japan

Born in Kyoto, Riko (Toshiyuki) Majima graduated from the Department of Chemistry of the College of Science at the Tokyo Imperial University in 1899. After a four-year stay, from 1907 to early 1911, in Europe, where he studied under Carl Dietrich Harries (1866-1923) in Kiel and under Richard Willstätter (1872-1942) in Zurich, he became a professor of organic chemistry at the newly established Tohoku Imperial University in March 1911. He became particularly famous for his study of urushiol (a catechol [o-dihydrobenzene] derivative), the main components of the sap of the Japanese lacquer tree (*Rhus verniciflua* Stokes*, urushi-no-ki* in Japanese). Known in Japan as a black glossy varnish, the lacquer tree is an important indigenous commercial source of natural lacquer. Majima started the organic chemistry research school with a specific approach, the study of local natural products using methods newly developed in Europe, which became a research tradition in organic chemistry that existed in Japan until the early 1960s.

A leader of the first generation of Japanese organic research chemists, Majima contributed greatly to the establishment of organic chemistry laboratories at universities and research institutions in Japan, including the Tohoku Imperial University, the Hokkoaido Imperial University, the Osaka Imperial University, the Tokyo Institute of Technology, and a laboratory in the Research Institute of Physical and Chemical Sciences (RIKEN).

He also took the initiative of publishing *Complete Chemical Abstracts of Japan*, collections of abstracts of all chemical papers in Japan from 1877 to 1964, amounting to 348,517 abstracts occupying a total of 34,211 pages with comprehensive subject and author indices.

Majima's diary, with daily entries from 1914 to 1959, reveals much about scientific life in Japan, showing something of the everyday lives of some well-established chemists in the first half of the twentieth century.

SPECIAL PLENARY SESSION

CHEMISTRY: A KEY TECHNOLOGY FOR NUCLEAR ASSEMBLY

Philippe Garderet,

Scientific Vice-President, AREVA, France

SESSION 2A
Historians and their sources

LES ARCHIVES DE LA FACULTÉ DE PHARMACIE ET D´ODONTOLOGIE ET L'HISTOIRE DE L'ENSEIGNEMENT DE LA CHIMIE À RIBEIRÃO PRETO, BRÉSIL

Glaucia M. Da Silva, Léo Degrève,
Felipe Conrado De Sousa, et Lucas R. Testa

Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto
Universidade de São Paulo, Brésil.

Afin de reconstruire et de préserver l'histoire de l'enseignement supérieur de la chimie à Ribeirão Preto, ville de plus de 600.000 habitants de l´état de São Paulo au Brésil, nous avons examiné et photographié des documents et des photos, conservés dans les Archives Publiques et Historiques de la ville et par le Centre de Documentation de la Faculté de Pharmacie de Ribeirão Preto de l'Universidade de São Paulo, anciennement École de Pharmacie et d'Odontologie.

La plus grande partie des documents des Archives Publiques, donnés par la famille de l'un des fondateurs de l'École, n'est ni organisée, ni répertoriée. Au Centre de Documentation, après avoir eu recours au Directeur de la Faculté, nous avons pu consulter, uniquement avec l'aide d'un employé, quelques cinq rapports d'inspections couvrant partiellement les années 1929 à 1954. Ce matériel révèle que l'enseignement supérieur de la chimie à Ribeirão Preto a débuté en 1924 lors de la fondation de l'École de Pharmacie et d´Odontologie qui a été la première école d'enseignement supérieur de la ville.

L'introduction de la chimie a été différente dans d'autres écoles brésiliennes où son enseignement a commencé dans les Écoles Polytechnique et de Médecine. La chimie a toujours occupé une place de choix dans tous les cours de pharmacie, par exemple, la discipline de Chimie Inorganique et Appliquée de première année de l'École de Pharmacie et d'Odontologie était la plus chargée en 1929. Les disciplines de Chimie incluaient aussi des séances de travaux pratiques. Leurs programmes, du moins ceux que nous avons pu retrouver, ne font pas mention de bibliographie mais en cherchant dans les archives électroniques de l'USP, on a découvert, dans la bibliothèque du campus de l'USP à Ribeirão Preto, quels étaient les livres de chimie qui étaient mis à la disposition des étudiants à cette époque.

Publications:

Silva, G.M., "The trial of Lavoisier: a strategy for teaching chemical revolution in a History of Chemistry Course". *Proceedings of the 6th International Conference on the History of Chemistry* (Louvain, 2007), 677-683.

Silva, G.M., Degrève, L.; Moi, G.A. : "Analyses of the historical thermodynamics contents in the Physical Chemistry textbooks used in Brazil". *Book of Abstracts* of the XXIII[e] International Congress of History of Science and Technology (Budapest, 2009), 691-692.

Silva, G.M., Degrève, L. : "Fermat, Maupertuis, Einstein e de Broglie: fundamentando a Mecânica Quântica". *Livro de Resumos* do XV Simpósio Brasileiro de Química Teórica, Poços de Caldas, Brasil, 2009. p.384.

LES ARCHIVES CURIE ET LA RECHERCHE SUR LA RADIOACTIVITÉ AU PORTUGAL

Isabel Serra
SAHFCFC, Université de Lisbonne, Lisbonne, Portugal.

Elisa Maia
CFCUL, Faculdade de Ciências, Université de Lisbonne, Lisbonne, Portugal.

La radioactivité fut un domaine scientifique d'élection au Portugal, depuis son émergence. En effet, des études de radioactivité des eaux, auxquelles a participé Pierre Curie, ont été réalisées systématiquement dès le début du vingtième siècle. La recherche fondamentale dans le domaine est aussi liée au Laboratoire Curie, mais cette fois-ci d'une manière bien plus étroite, étant donné que les premiers chercheurs portugais en radioactivité ont presque tous fait leur formation avec Marie Curie, Irène Curie et Frédéric Joliot.

Dans les Archives Curie, on peut rencontrer bien préservés des documents relatifs aux séjours des chercheurs portugais au laboratoire Curie. On y trouve des lettres, des rapports, ainsi que des références et des renseignements concernant leurs travaux scientifiques, ou encore de la correspondance sur des sujets de recherche entre Marie Curie et les Portugais.

Tous ces documents permettent de suivre le trajet de ces chercheurs dans une période fondamentale pour leur carrière et aussi pour les travaux qu'ils ont développés ensuite au Portugal. Ces éléments ont contribué à éclaircir plusieurs aspects de l'histoire des sciences au Portugal dans la première moitié du vingtième siècle et aussi à mieux comprendre la dynamique de transfert des connaissances scientifiques entre centre et périphérie.

Remerciements

Nous remercions les Archives Curie qui ont facilité notre accès à la documentation pertinente. Ce travail de recherche a été financé par le Projet PTDC/HCT/81550 de la FCT (Fundação para a Ciência e Tecnologia).

Références

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Serra and Peiriço (2006), "Portuguese chemists and radioactive minerals", in Isabel Malaquias, Ernst Homburg, M. Elvira Callapez (ed.), *Proceedings* of the 5th International Conference on History of Chemistry: Chemistry, Technology and Society, Lisbon, Sociedade Portuguesa de Química, 653-660.

ARCHIVES ET LABORATOIRES. LES SOURCES DE L'HISTOIRE DE LA CHIMIE À L'INSTITUT PASTEUR, XX^{e} – XXI^{e} SIÈCLES.

Denise Ogilvie
Archives nationales, Paris, France

En 1900 s'ouvrait à l'Institut Pasteur un grand bâtiment élevé face à celui que Pasteur avait fait construire 12 ans plus tôt pour abriter son institut. D'une taille et d'une forme comparable, l'imposant édifice portait à son fronton l'inscription "Institut de chimie biologique". Autour d'un grand amphithéâtre se déployaient deux ailes qui abritaient deux grands laboratoires et leurs annexes : l'un consacré à la chimie organique, l'autre à la chimie biologique. Un service des fermentations et une brasserie complétaient l'ensemble. Derrière le bâtiment s'élevait un hôpital. Cinq ans après la mort de Pasteur, son successeur Emile Duclaux traçait ainsi pour l'institut un programme clair, qu'il dotait d'un équipement complet : jusqu'à nos jours à l'Institut Pasteur les travaux des chimistes et biochimistes ont croisé ceux des médecins, des microbiologistes et de leurs successeurs.

Le grand bâtiment de l'Institut de chimie biologique est, en ce moment même, en complète rénovation, les laboratoires vidés, les cloisons abattues. Cette communication n'a pas l'ambition de retracer l'histoire des travaux qui y ont été menés. Mais plus modestement elle se propose de montrer comment progressivement, autour de la bibliothèque, puis d'un Musée, puis d'un service d'archives l'institution a consenti à en conserver trace.

Publication

Denise Ogilvie, “L'Institut Pasteur, un patrimoine dans tous ses états”, *Gazette des Archives*, n° 179, fascicule 4, p. 437-453.

SESSION 2B

Historians and their sources

PHOTOGRAPHY AS CHEMICAL INQUIRY. THE LUMIERE BROTHERS' QUEST FOR ORGANIC DEVELOPERS

Sara Carvalho
CCMM, University of Lisbon, Lisbon, Portugal

Maria Estela Jardim
Faculty of Sciences, University of Lisbon, Lisbon, Portugal

Fernanda Madalena Costa
CCMM, University of Lisbon, Lisbon, Portugal

The history of photography entails a wide array of techniques, devices, and developing processes. During the nineteenth and early twentieth centuries research was carried out by chemists all over Europe in the field of organic chemistry as applied to photography. In 1873 the German photo-chemist Hermann Wilhelm Vogel (1834–1898) began research on photographic emulsions using new organic dyes, which led to a great improvement in the sensitivity of the plates and opened a new era in photography. These organic compounds, which he named *optical sensitizers,* made it possible to extend the sensitivity of the plates to the green and orange parts of the spectrum. The formation of the latent image was heavily dependent on the chemicals used as developing agents; as with the improvement of photographic emulsions, advances in organic chemistry were also very helpful in this field. Momme Andersen (1857-1954) and Josef Maria Eder (1855-1944), respectively in Germany and Austria, succeeded in investigating of organic developers for dry-plates that were promptly and widely adopted. In France, the Lumière brothers joined forces with the chemist Alphonse Seyewetz (1869-1940) to carry out chemical research in the same field at their factory in Lyon.

In this paper the chemical interpretation of the organic developer's role in photography is analysed by using the work of the Lumière brothers and Seyewetz as a case-study, based on some of their original notes and particularly on a series of papers published during the late nineteenth and early twentieth centuries in the *Bulletin de la Société Française de Photographie,* hitherto overlooked by historians of photography.

THE SOCIAL HISTORY SOURCES OF FRENCH CHEMICAL HISTORY

Erik Langlinay
EHESS, Paris, France

On 24 August 1905, a group of workers at the Établissements Kuhlmann's chemical factory at Loos, near Lille gathered and started a strike. A week later, on 31 August, they were joined by a number of workers specializing in the manufacture of phosphates bags, who demanded an increase in wages of "one centime per bag". According to the police reports, the strikers were calm. Their strategy was conveyed by the police superintendent, who said that the number of strikers appeared to vary little, although the number of stokers had diminished. He reported that out of 60 workers, only 21 remained on strike. He went on to explain that the tactic of the strikers was first to win over the unskilled workers and then to focus on the skilled operatives. As he predicted, if another ten workers joined the strike, however, the processing of sulfuric acid would soon stop (1).

The failure of the strike is of little importance in French social history. But it gives a hint of the different social categories employed by French chemical companies – even though these have left no trace in board minutes – and of the strategies they used. After reviewing a number of specific cases the paper will discuss the materials of social history (strikes, accidents…), mainly those kept by local institutions (Archives municipales, Archives départementales), and demonstrate their value for work in the social history of technology. I shall also try to explain the huge number of strikes in the chemical industry during the 1900-1930 period, considering the question of what it means "to do chemistry". The paper will conclude by discussing the conservation of contemporary materials of social history (oral history, posters, leaflets…) and their interest for historians.

Note

(1). AD. Nord, M621/36, Rapport du 28 août 1905.

Références

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Erik Langlinay, "Apprendre de l'Allemagne ? Les scientifiques et industriels français de la chimie et l'Allemagne entre 1871 et 1914", in *L'économie, l'argent et les hommes. Les relations franco-allemandes de 1871 à nos jours*. Colloque des 10-11 mai 2007, Comité pour l'histoire économique et financière de la France, 2009, 113-129.

Erik Langlinay, "Kuhlmann at War (1914-1924)", in Roy MacLeod and Jeffrey Allan Johnson (eds), *Frontline and Factory. Comparative Perspectives on the Chemical Industry at War, 1914-1924* [Archimedes, v. 16] (Springer, 2006), 145-166. Link: *Frontline and Factory: Comparative Perspectives on the Chemical Industry at War*, *1914-1924*.

CHEMICAL LANDMARKS AND PUBLIC UNDERSTANDING

Seymour H. Mauskopf
Duke University, Durham, NC, USA

The American Chemical Society's National Chemical Landmarks Program recognizes and celebrates landmark achievements of chemists, chemical engineers, and the chemical enterprise. In doing so, the Landmarks Program enhances the public's recognition and appreciation of the contributions of the chemical sciences and chemical engineering to modern life and to increase the sense of pride in their practitioners. This talk will review the program's evolution and operation and highlight several key chemical landmarks.

SESSION 3A

Historians and their sources

THE UNILEVER COLLECTION AND THE DILEMMAS OF COLLECTING MODERN CHEMICAL HERITAGE

Ad Maas
Museum Boerhaave, Leiden, The Netherlands

The research laboratory of the Dutch-British multinational Unilever, located in the city of Vlaardingen, is one of the most important industrial laboratories of twentieth-century Netherlands. It specialized, in particular, in research on margarine and washing-powder, resulting in such well-known products as Becel and Omo.

In my presentation I will discuss the historical collection of the Unilever research laboratory that has recently been acquired by Museum Boerhaave, the Dutch national museum for the history of science and medicine. This collection reflects the typical challenges presented to museums by the chemical heritage of modern times: it consists largely of mass-produced bulk instruments, which are moreover hard to understand for laymen. I will argue that, rather than from their 'intrinsic' qualities (aesthetic value, rarity, intriguing working, etc.), these instruments derive their value from the story they represent. They are 'key-pieces'--- 'keys' to a story behind them--- rather than showpieces.

I will explain how this 'key-pieces approach' has assisted in making an appropriate selection of instruments for the collection of Museum Boerhaave. And I will discuss particular examples of instruments that illustrate Unilever research and throw light on the intriguing Unilever-history that they represent.

Publication

A. Maas, 'The Storyteller and the Altar: Museum Boerhaave and its Objects', in S. Lehmann-Brauns, Ch. Sichau, and H. Trischler (eds.), *The Exhibition as Product and Generator of Scholarship* (Max Planck Institute for the History of Science, preprint 399) pp. 59-69 (http://www.mpiwg-berlin.mpg.de/en/resources/preprints.html).

CIAMICIAN'S CHEMISTRY COURSES IN BOLOGNA (1889-1921) A SELECTION OF STUDENTS' LECTURE NOTES

Marco Taddia
"Giacomo Ciamician" Department of Chemistry, University of Bologna, Italy

Giacomo Ciamician was born at Trieste in 1857. His father's family was of Armenian origin. He studied chemistry in Vienna and received his doctorate from the University of Giessen in 1880. During the Viennese period, Ciamician the student committed himself to cultivating various scientific interests, frequenting certain laboratories of the Polytechnic. The precociousness of his genius is shown by approximately fifteen communications, partly published between 1875 and 1879. Of particular interest were the researches on spectroscopy, appreciated by Mendeleev, that ended in the physics laboratory run by Professor Pierre, when Ciamician was not even twenty years old.

In 1880 he became an assistant to Stanislao Cannizzaro in Rome. While in Rome, he was appointed to a Readership and delivered courses of lectures on spectroscopy and on organic chemistry. He became professor of General Chemistry at the University of Padua in 1887 and two years later was called to the corresponding chair at the University of Bologna, where he remained until his death in 1922. Between 1880 and 1905 he published about eighty papers on pyrrole and its derivatives. He also studied organic compounds of vegetal origin (1888-1899), carried out the first systematic study of the behaviour of organic substances toward light (1900-1915) and conducted research on vegetable chemistry. His numerous pupils filled the most important chairs of chemistry in Italy. This impressive amount of work gave him authority in treating questions of general interest. His mind was open to the future, and he dreamed of a clean world without pollution from fossil fuels. He insisted on taking advantage of solar energy and on imitating the assimilating processes of plants.

Ciamician took great care in teaching, and his lessons earned the applause not only of the students but also of citizens who came to listen as unregistered students. American visitors attending some of his lectures were also impressed by his clear and logical style. Ciamician never collected his lessons into books or in lecture notes. The lessons of the last academic year in which he taught (1920-1921) were reconstructed by Bruno Ghetti. Previously, notes of his lessons were collected by students Bruno Maggesi and Andrea Stagni and were repeatedly checked until c. 1915.

The present communication will focus on the secrets of Giacomo Ciamician's successful teaching emerging from previously neglected documents such as student lecture notes.

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THE COMPUTATIONAL CHEMISTRY LIST

COMPRENDRE LES CHIMISTES COMPUTATIONNELS À TRAVERS LEURS ÉCHANGES AU SEIN D'UNE MAILING LIST

Alexandre Hocquet
LCPM-CNRS, Université de Nancy, Nancy, & Centre Alexandre Koyré, Paris

La Computational Chemistry List (CCL) est une mailing-list créée à l'Ohio Supercomputing Center en 1991 pour cimenter les liens d'une communauté scientifique alors émergente, les chimistes « computationnels ». Depuis vingt ans, elle sert de forum d'opinions, de plateforme d'échanges scientifiques et/ou de carrières, et aussi de mise à disposition de logiciels.

Depuis sa création au moment des premiers balbutiements de l'Internet universitaire et de la diffusion massive d'ordinateurs personnels, à travers les archives de ses milliers de messages, elle constitue un corpus privilégié pour comprendre les mutations professionnelles, scientifiques et de société de cette communauté de chimistes, en particulier, en relation avec leur outil de travail, le logiciel de modélisation moléculaire.

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DOCUMENTATION, EVALUATION AND RE-USE OF HERITAGE SITES OF THE CHEMICAL INDUSTRY

Session Organizer: **Helmuth Albrecht**
Institute for Industrial Archaeology, History of Science and Technology, Technical University Mining Academy, Freiberg, Germany

Introduction

Heritage sites of the chemical industry are a very special kind of industrial heritage with specific characteristics. Despite the fact that chemical production is one of the largest and most important types of industrial production in the development of industry, interest in the preservation, conservation, and re-use of historic important sites of this kind is relatively low compared to other types of industry like mining, metallurgy, textile, mechanics, or electricity. The session tries to give an impression of this fact and of the special heritage problems of the chemical industry in three papers: (1) A regional case-study about the documentation and evaluation of heritage sites from chemical industry in Saxony/Germany. (2) A local case-study about the re-use of an electrochemical site in Odda/Norway. And (3) the analysis of historic coke plants in Germany as monuments of science, technology, architecture, and environment.

DOCUMENTATION AND EVALUATION OF INDUSTRIAL HERITAGE SITES OF THE CHEMICAL INDUSTRY IN SAXONY, GERMANY

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From the end of the nineteenth century the chemical industry of Saxony developed into one of the leading industrial sectors of the country, along with other sectors like the textiles, machine tools, or the automobile industry. While in other parts of Germany the chemical industry was organized in large integrated companies like BASF, Hoechst, or Bayer, the chemical industry in Saxony developed in more specialized production sectors with small or mid-sized companies with regional priorities, for example in the production of soap (Chemnitz), essential oils (Leipzig), and drugs (Dresden).

Despite the importance of the chemical industry for the development of industry in Saxony, today only 33 monuments of the chemical industry are listed among more than 8.000 industrial monuments in this region. The paper – a result of a master's thesis in the industrial archaeology program at the Institute for Industrial Archaeology, History of Science and Technology in Freiberg – examines the reasons for this astonishing fact, the characteristics of the listed monuments, their representativeness for the history of chemical industry in Saxony, their spatial and chronological distribution as well as their condition and actual or potential re-use.

THE RE-USE OF AN ELECTROCHEMICAL PLANT IN THE FJORDS OF NORWAY

Randi Bårtvedt
Nordic Waterpower and Industrial Museum, Tyssedal, Norway

Norway has a large number of fjords, waterfalls, and watercourses, which create perfect conditions for tourism. Odda in the Hardangerfjord area was a favourite tourist resort during the 1800s. During the 1900s the same landscape made Odda ideal for the electrochemical industry with hydroelectricity as the key resource. The development of hydroelectricity is the most significant factor contributing to economic growth and welfare in Norway. However, without foreign investors and expertise it is unlikely that Norwegian capital would have managed to fund and develop the pioneering plants. The introduction of electrochemical mineral fertiliser production helped to give Norwegians technological confidence. Norway dominated the world market in this field for several decades.

The Odda factories (1908) were established by a British company and closed down in 2003. The calcium carbide and cyanamide factories were the largest of their kind in the world. The market for acetylene and fertiliser was big and global. The factories and the adjacent hydro-power plant at Tyssedal are now candidates for the UNESCO World Heritage List. Nevertheless, the electrochemical plant is seen as “too young and too ugly” for industrial heritage, and there is pressure to get it demolished, whereas the old hydro-power plant is seen as a “cathedral” and is now a museum.

How can a political understanding be established with money for preservation and new use in a time of financial crisis and big changes? How can the site be transformed to maintain its integrity and character? How can new activities and jobs be combined with preservation? How can we secure the quality of industrial heritage for future generations? The potential is at once in tourism, education, experience, excitement, and industry. I want to discuss and present some of the prospects and possibilities and a new concept based on the history and the monuments of an electrochemical plant once of world importance.

OF WHITE AND BLACK SIDES. HISTORIC COKE PLANTS AS MONUMENTS OF SCIENCE, TECHNOLOGY, ARCHITECTURE, AND ENVIRONMENT IN GERMANY

Alexander Kierdorf
German National Committee of TICCIH, Cologne, Germany

The use of coke made from hard coal to melt iron ore since the 18th century led to the development of coke ovens and coke plants. But only in the mid-19th century, with the spread of gasworks based on a similar method, did the by-products of these processes become of concern to inventors and manufacturers. Tar in particular found a number of very important uses.

From the early 20th century, the separation and re-utilization of a number of major by-products was systematized. This is structurally and architecturally expressed by the organization of coke plants in black (coal-orientated) and white (chemical) sides, separated by huge coke oven batteries, crowned by coal silos. In the 1920s, coke plants were designed by leading industrial architects to express the power and rationality of technology and industrial organization. Today, three plants from different periods are left in Germany, all three of them preserved almost entirely: at Voelklingen (Saar mining region), Dortmund (Hansa), and Essen (Zollverein).

All have high monument rank (two are part of World Heritage sites). But they also bring special problems with them: severe contamination, the difficulty of the open-air preservation of technical equipment once created for working conditions, and almost no “use“ other than as huge exhibition and excursion pieces. Next to blast furnaces, coke plants symbolize the strangeness of large-size technical structures to ordinary humans. This is still truer of the “White Sides“, with their logic and pressing need to find uses for any kind of waste. As they are not self-explanatory, they tend to be overlooked or to be re-interpreted as visual and material phenomena, as patterns or sculptures.

There has been a lot of discussion, experience, and change of concepts in the preservation, use, and presentation of such sites in recent decades (Bigstuff), and still we are convinced that not only the clean, sparkling monuments but also the ugly-smelling workhorses and forbidden places need and deserve a place in Industrial Heritage.

SESSION 4

Institutions and the heritage of chemistry for historians

LES ARCHIVES DÉPARTEMENTALES DE LA SAVOIE ET LE PATRIMOINE INDUSTRIEL DE LA CHIMIE

Francine Glière
Archives départementales, Chambéry, France

Les archives départementales de la Savoie ont été attentives dans les années 1980 à la sauvegarde de la mémoire industrielle de la Savoie : à ce titre ont été collectées des archives privées d'entreprise en cours de fermeture, parfois avec l'aide d'associations telles celle des « anciens de l'électrochimie ».

Au début du XX^{e} siècle, est d'abord apparue la révolution de la houille blanche par la mise en valeur du potentiel hydroélectrique des cours d'eau. Les secteurs les plus fortement concernés ont été dans les Grandes Alpes, surtout en Savoie la Tarentaise et la Maurienne. Ces vallées sont devenues le domaine des grandes entreprises ; les usines d'électrochimie et d'électrométallurgie se sont multipliées sur l'initiative d'ingénieurs, bouleversant l'environnement social et économique autant que les paysages de montagne.

Ces réalisations sont particulièrement représentées par les fonds suivants que la communication au colloque se propose de présenter par les liens suivants :

Fonds Paul GIROD (1889-1951), Ingénieur chimiste, inventeur et industriel, créateur des aciéries d'Ugine
Fonds de l'Association des anciens de l'électrochimie (1898-1991)
Fonds de la Société ATOCHEM, usines de la Chambre, Epierre, Orelle-Prémont (1856-1982)
Fonds de la Société des carbures métalliques (usine du Glandon à Saint-Avre) (1912-1956)

CONSERVATION DU PATRIMOINE : LA CHIMIE EN OCÉANOLOGIE

Gilles Chatry
Ifremer, Service API, PLOUZANE, France

Depuis plusieurs décennies, l'Ifremer, Institut français de recherche pour l'exploitation de la mer, contribue à la recherche océanologique dans des domaines qui concernent l'environnement, les géosciences, l'halieutique et l'aquaculture, l'hydrothermalisme, les biotechnologies. La chimie marine joue un rôle important dans la mise en œuvre de ces disciplines scientifiques. En 2006, un service archives est créé pour organiser la conservation des dossiers et des documents scientifiques. Le service s'attache à reconstituer l'histoire de l'institut et étend l'archivage à tous les supports et aux instruments de l'océanographie.

De nombreux savants se sont intéressés à la composition de l'eau de mer depuis des siècles. Nos anciens ont créé des laboratoires de chimie à terre et à bord des navires océanographiques. Des réseaux de contrôle de l'eau de mer, de la matière vivante, des sédiments ont été développés. La participation aux projets nationaux et internationaux sur l'environnement et le climat conduit aujourd'hui à la connaissance en temps réel des propriétés chimiques de l'eau dans l'océan mondial et en zone côtière. Un archivage des données des campagnes scientifiques à la mer est réalisé. L'Ifremer développe des techniques évoluées de prélèvement et d'analyse pour les recherches en domaine côtier, au large et dans les abysses.

La collecte systématique des archives, des documents et des instruments, est effectuée sur toutes les implantations par l'intermédiaire de correspondants, de gestionnaires de matériel, de chercheurs. Un inventaire des versements d'archives, des collections et des instruments est tenu à jour. Les techniques les plus modernes de conservation et de restauration sont adoptées. Les publications des chercheurs sont interrogeables sur l'internet sous une forme numérique. L'ensemble est l'objet d'une diffusion et d'une mise en valeur et constitue une source d'étude et de recherche pour les historiens, les étudiants et le grand public.

SCIENCE, TECHNOLOGY, AND THE FUTURE OF HISTORY

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The records of modern chemistry are an integrated body of information influenced by individuals, teams, institutions, and professional organizations. Each year these records grow in both volume and complexity, fueled by an ever increasing number of practicing scientists, and the rapid growth of new specialties, sub-specialties, and interdisciplinary interactions. Modern technology has assisted in driving this growth, and has forever changed the nature, quality, and amount of traditional archival sources. In light of these changes, archivists of science must reconsider their acquisition and preservation strategies for the 21st century.

The selection and appraisal of archival records is an archivist's most intellectually challenging and demanding task. It is not something to take lightly as the quality and character of the historical record depend on their sound judgment. Indeed, the records that an archivist does not retain today may be lost to society forever.

The complexity and abundance of 21st-century scientific records illustrate the need for archivists to become historians (to better understand how sources are used and the current trends within the field), historians to become scientists (to better understand the complexity of their topic), and scientists to become archivists (to help identify and preserve the most significant records, as well as the means to access them).

This paper will re-examine many traditional assumptions about the nature of the 21st-century scientific archival record, specifically addressing the questions: "How

are digital records created and how do we authenticate them?", "How are they different in format, content, and volume?", "What are the needs of scholars?", "What are the implications of obsolescence and ephemeral media and how will they affect acquisition timelines?", "How can old and new practices be integrated?", and most importantly, "How do we bring chemists, historians, and Information Technology specialists together to address the looming problems ahead?"

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Patrick Shea, "Suspended in Orbit: Dudley Saville and the Microgravity Spacelab", *Chemical Heritage Magazine* (Summer 2007).

Patrick Shea, "Alexis Carrel" entry for the *Dictionary of Medical Biographies,* 2007.

LA CHIMIE CONTEMPORAINE, UNE DISCIPLINE SANS HISTOIRE ?
TWENTIETH-CENTURY CHEMISTRY
A DISCIPLINE WITHOUT A HISTORY?

Muriel Le Roux
Maison Française d'Oxford, Oxford, Royaume-Uni

Contrairement à la chimie académique, le patrimoine de la chimie industrielle du XIX^{e} siècle et du premier XX^{e} siècle ne fut l'objet de soins et d'attentions tardifs qu'après que les historiens eurent commencé à étudier l'histoire des entreprises. Si cela a pu sembler acquis à l'aube des années 1990, il n'en fut rien.

L'héritage laissé par la chimie très contemporaine du second XX^{e} siècle mérite que l'on s'y attache pour de nombreuses raisons. Tout d'abord, et cela n'est en rien spécifique à cette discipline, à mesure que le temps passe les interactions qui se produisirent ont transformé cette discipline. Qu'il s'agisse de l'évolution de la discipline académique en sous-disciplines ou des relations de plus en plus complexes de la chimie universitaire avec le monde industriel, ces évolutions rendent ténue la délimitation des territoires et rendent difficiles le travail du conservateur et celui de l'historien. C'est un thème d'étude pour l'historien, un souci pour le conservateur qui, en France, ne bénéficie pas des moyens suffisants pour réagir en temps réels.

La question de la protection des archives de la chimie universitaire contemporaine n'est pas récente, mais se pose avec plus d'acuité que jamais. Il sera plus difficile d'écrire son histoire que celle de la chimie du début du XX^{e} siècle. Nous rappellerons pourquoi au cours de cette présentation.

À ces changements connectant de façon réflexive chimie universitaire et chimie industrielle s'en ajoute un autre tout aussi important : le redéploiement des stratégies industrielles des années 1990-2000. Les fusions, cessions, acquisitions brouillent l'image publique des entreprises et transforment ce

secteur en un vaste imbroglio rendant la tâche des conservateurs et des historiens ubuesques. Qui conserve quoi et où ? Telles sont les questions qu'il faut résoudre avant de procéder au moindre questionnement. Encore faut-il que la question patrimoniale ait été posée. Nous verrons qu'il n'y a jamais rien d'acquis dans ce domaine.

Écrivant l'histoire de deux médicaments la Navelbine et le Taxotère produits par l'industrie à la suite des découvertes faites par les équipes de l'ICSN – CNRS que dirigeait Pierre Potier, nous avons eu recours aux archives publiques et industrielles, nous avons interviewé des chercheurs universitaires et industriels, des administrateurs et des gestionnaires, des juristes et des exploitants, pour tenter enfin d'approcher des médecins et leurs patients. Localiser les archives, tenter de protéger ce qui reste, obtenir l'autorisation d'y avoir accès, les lire, les interpréter en inventant de nouvelles méthodes de travail, enregistrer la parole des acteurs afin de constituer des archives orales (qui souvent éclairent les vides), refaire le même chemin dans le monde industriel, sont les tâches ardues auxquelles l'on se livre pour redonner du sens à ce qui de loin apparaît comme un "fuzzy world".

Cette démarche classique lorsque l'on étudie un segment du processus devient risquée lorsque l'on étudie un fait chimique depuis l'idée jusqu'à l'objet tant l'incertitude de finir est grande. L'absence d'une approche globale des questions patrimoniales en segmentant les responsabilités pose à terme la question de la faisabilité de ce type d'histoire, mais, bien plus, hypothèque le droit de l'honnête homme à se faire sa propre opinion. Cette présentation aura pour objet de pointer les risques qu'encourt le patrimoine de la chimie des cinquante dernières années rendant possibles toutes manifestations à l'égard de cette science.

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SESSION 5

Chemists and the general public

STORIES ABOUT CHEMISTRY. ILLUMINATING FOLKLORE

Robert Bud
The Science Museum, London, United Kingdom

The history of chemistry is replete with familiar and attractive stories of past achievements and the benefits of the science. Such allegorical stories are disseminated by museums as they curate the objects which embody them and assure their truth. They are used to show the contemporary relevance of the past, and indeed these narratives do still have an ongoing ability to arouse contemporary interest. At a meeting of his political party, a British government minister recently reflected on contemporary policy by evoking eighteenth-century stories. He contrasted the unremunerative work of Priestley on carbon dioxide with Mr Schweppes's more commercial approach. Professional historians have doubted the accuracy of many such tales and naïve visions of the potential relations between science and practice. This paper suggests, however, we do not need merely to discard these as the simplistic retelling of bad history.

Historians and curators can also regard the repertoire of narratives repeated about a field as an important part of its identity. In recent years students of organizations have become interested in the use of folklore studies to understand the role and significance of stories that circulate within organisations. Similarly, this paper will examine the role of stories about the uses of chemistry, in the developing identity of the field in the nineteenth and twentieth centuries. Using the techniques and approaches of folklore analysis, it will look at the role of narratives of chemistry in cementing the association of esoteric academic work, preparation for a practical career, and commercial benefit. It will reflect too on the occasion of the retelling of such stories.

This paper therefore suggests an agenda of research for historians of communication in chemistry, and in particular for museums, so that they can be self-aware and canny in their preservation and use of familiar stories.

Publications

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Robert Bud, "Life, DNA and the Model", *British Journal for the History of Science* (forthcoming).

EDUCATIONAL POTENTIAL OF HISTORICAL ARTIFACTS RELATED TO CHEMISTRY

Elena Zaitseva (Baum)
Lomonosov Moscow State University, Moscow, Russia

At present there exists a global trend of widespread reorientation of the educational paradigm from a cognitive and informational one to one that can be described at culturological. In this connection, in secondary schools and higher educational establishments much importance is attached to the active use of museum practice in the teaching of the natural sciences, chemistry in particular.

The methodological principle of "museum historicism" entails a special approach to such source material as artefacts. Exhibition pieces are subject to the process of cultural transformation: they lose their everyday significance and obtain an "ultimate" significance. The museum collection becomes the image of the epoch for the visitors, and museum space is shaped as a dialogue of cultures.

Innovative museum practice for teaching chemistry has been introduced in many higher educational establishments in Moscow. Among them: University of Chemical Technology of Russia (funds of its own UCTR Historical Museum are used), Russian State University of Oil and Gas (RSUOG), Moscow State University of Railway Engineering (URE), Chemical faculty of Moscow State University, and others. Along with using funds of the Museum of University History, RSUOG pedagogic practice involves specially equipped classes with exhibition glass-cases dedicated to the development of history of industrial oil refining (19^{th} – 20^{th} centuries). In 1898 the Moscow Engineering Academy (now the URE) erected a separate building for chemists, according to the layout of the famous Russian physical chemist I.A. Kablukov (1857-1942). Premises in this building were equipped on the model of the Leipzig laboratory of W. Ostwald. It continues to preserve a memorial museum laboratory named after I. A. Kablukov, where the opening lecture "Introduction to the chemical profession" is read to all students. A unique monument to the pedagogic activity of Kablukov is also the museum of demonstration experiments and devices in the sphere of chemistry, established by a scientist in the 1930s at the Agricultural Academy K. A. Timiryazev. Experience in working with students shows that exposure to chemical-historical exhibitions including the use of artifacts has a simultaneous impact on intellectual and emotional spheres of personality, stimulating a more positive attitude toward chemical heritage and making possible an understanding of culture in its catholicity. In the present paper substantial aspects of such presentations are demonstrated.

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FROM CHEMISTRY TO HISTORY. CHEMIST-HISTORIANS AND THE JAPANESE SOCIETY FOR THE HISTORY OF CHEMISTRY

Yasu Furukawa
Society for the History of Chemistry & Nihon University, Fujisawa, Japan

This paper traces the origins of Japan's chemist-historians and the development of their community from the late 19th century to the present. Chemist-historians are those who are primarily chemists, but are also scholars of the history of chemistry. A close examination of the university origins of chemist-historians in Japan shows the dominance of graduates from the Department of Chemistry at Tokyo Imperial University (today's University of Tokyo). Chemistry students here were exposed to history through a unique kind of chemical education that stressed examining the origin of modern European chemistry. The style of teaching of its faculty members (including Joji Sakurai and Yuji Shibata) inspired enthusiasm for chemical history among students, and hence a generation of chemist-historians emerged.

Due to the post-war educational reforms in Japanese universities, by the 1960s, some chemist-historians had become professional historians, obtaining full-time teaching posts in the history of science and giving up their former identities as chemists. In 1973, the Japanese Society for the History of Chemistry was founded by a group of interested professional historians and chemist-historians. Within seven years, the membership had reached nearly five hundred. In 1974, the Society first published *Kagakushi*, which would become its quarterly journal after 1982. The Society also played a pivotal role in reproducing a number of Japanese chemistry textbooks written in the 19th century.

By 2000, the Society's membership had dropped to three hundred, perhaps because many chemist-historians of the pre-war generation have passed away, and few younger chemist-historians have appeared. Chemical departments no longer produce chemist-historians, and young, practicing chemists have taken less and less interest in history. The new generation of professional historians leading the Society has less background in the practice of chemistry. Thus, the path from chemistry to history, through which both chemist-historians and professional historians emerged, seems to have faded from the chemical history community in Japan.

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2. "Gen-itsu Kita and the Kyoto School's Formation" (in Japanese), *Kagakushi*, 37 (1) (2010), 1-17.

3. *Inventing Polymer Science: Staudinger, Carothers, and the Emergence of Macromolecular Chemistry* (Philadelphia: University of Pennsylvania Press, 1998).

ROUND TABLE

Chair: Jeffrey A. Johnson

Access to sources and institutions. Private policy, public policy

with contributions by

Alexander L. Bieri (Hoffmann-La Roche, Switzerland), Gildas Illien (BNF, France), Hans-Hermann Pogarell (Bayer, Germany).

LISTS OF SPEAKERS /
Speakers by Session

Abbreviations

ES : Special session
OL : Opening lecture
PL : Plenary lecture
RT : Round table

Addresses	**LAST NAME, first name**	**Quality**
FMC	BORFIGA, Jean-Bernard	Vice-President of the Fondation de la Maison de la Chimie
ESPCI	PROST, Jacques	Director of ESPCI ParisTech
ESPCI	LEQUEUX, François	Directeur scientifique de ESPCI ParisTech (France)

Chairs		
OL, PL3 PL4, RT	JOHNSON, Jeffrey	Professor, Villanova University, Pennsylvania, President of CHMC
PL1	EMPTOZ, Gérard	Professeur émérite, Centre F. Viète, Université de Nantes (France), Vice-Président du Comité français d'organisation
PL2	GILAT, Sylvain	Directeur de la communication, ESPCI ParisTech (France)
PL2	FOURNIÉ, Bastien	Président du Bureau des élèves, ESPCI ParisTech (France)
1A	MEINEL, Christoph	Professor, University of Regensburg (Germany), Former President of CHMC
2A	GARDERET, Philippe	Scientific Vice-President, AREVA (France)
1B	NIETO-GALAN, Agustí	Professor & Director of CEHIC, Autonomous University of Barcelona (UAB), (Spain)
2B	BRET, Patrice	Centre A. Koyré, CNRS, membre du Comité français d'organisation
3A	FOX, Robert	Museum of the History of Science, University of Oxford (UK)
3B	ALBRECHT, Helmuth	Director, Chair for Industrial Archaeology and History of Technology Institute for Industrial Archaeology, History of Science and Technology. Technical University Mining Academy, Freiberg (Germany)
4	VAN TIGGELEN, Brigitte	President of Mémosciences, Louvain-la-Neuve (Belgium)
5	KAJI, Masanori	Associate Professor, Tokyo Institute of Technology, Tokyo (Japan)

Plenary Lectures		
PL1	MARCHAL, Valérie	Chef de service, responsable de la numérisation, Institut national de la propriété industrielle (INPI), Paris (France)
PL 2 Public Lecture	FÉREY, Gérard	Professor, Membre de l'Institut de France, Académie des sciences, Médaille d'or CNRS 2010, Vice-Président de la Société chimique de France
PL 3	BRASHEAR, Ronald	"Arnold Thackray" Director of the Othmer Library of Chemical History, Chemical Heritage Foundation, Philadelphia (USA)
PL 4	ANDERSON, Robert G. W.	Vice-President, Clare Hall, University of Cambridge (UK) Chairman, Society for the History of Alchemy and Chemistry (SHAC), Director of the British Museum (1992-2002)
PL 5	REINHARDT, Carsten	Professor, University of Bielefeld (Germany), Chair of EuCHeMS Division of History of chemistry.

Session 1A		
1A	COOK, Rosie D.	Register and assistant curator, Chemical Heritage Foundation, Philadelphia (USA)
1A	LANDRY, Jennifer S.	Associate director of special collections, Chemical Heritage Foundation, Philadelphia (USA)
1A	MARTIN, Isabel	Chemistry Department, Deutsches Museum, Munich (Germany)
1A	REHN, Susanne	Curator for chemistry, Deutsches Museum, Munich (Germany)

Special Session		
ES	GARDERET, Philippe	Scientific Vice-president, AREVA (France)

Session 1B		
1B	ALFONSO-GOLDFARB, Ana	Chair, Center Simão Mathias for Studies in History of Science (CESIMA), Pontifical Catholic University of São Paulo, PUC-SP (Brazil)
1B	BENSAUDE-VINCENT, Bernadette	Professeur des universités, Cetcopra, Université Paris 1 Panthéon-Sorbonne, Paris (France)
1B	BERTRAND, Emmanuel	Pecsa, ESPCI ParisTech, Paris (France)
1B	FERRAZ, Márcia H.M.	Vice-chair, CESIMA ; Chair, Program of Post Graduate Studies in History of Science, PUC-SP CESIMA, Pontifical Catholic University of São Paulo (Brazil)
1B	JOURDIN, Sophie	Doctorante, Centre F. Viète, Faculté des sciences et des techniques, Université de Nantes (France)
1B	KAJI, Masanori	Associate Professor, Tokyo Institute of Technology, Tokyo (Japan)
1B	LOEVE, Sacha	Cetcopra, Université Paris 1 – Panthéon-Sorbonne, Paris
1B	TEISSIER, Pierre	Centre François Viète, Faculté des sciences et des techniques, Université de Nantes (France)
1B	WAISSE, Silvia	Professor, CESIMA ; Member of the Governing Board, Project *World History of Science Online*, IUPHS/DHST ; Pontifical Catholic University of São Paulo (Brazil)

Session 2A		
2A	DA SILVA, Glaucia M.	Departamento de Química – Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – Universida de São Paulo (Brazil)
2A	DEGRÈVE, Léo	Departamento de Química – Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – Universida de São Paulo (Brazil)
2A	MAIA, Elisa	Maître-assistant, CFCUL, Faculdade de Ciências, Campo Grande, Lisbon (Portugal)
2A	OGILVIE, Denise	Conservateur, Institut Pasteur, Paris (Portugal)
2A	SERRA, Isabel	Maître-assistant, Secção Autónoma de História e Filosofia das Ciências da Faculdade de Ciências, Campo Grande, Lisbon (Portugal)
2A	DE SOUSA, Felipe Conrado	Departamento de Química – Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – Universida de São Paulo (Brazil)
2A	TESTA, Lucas R.	Departamento de Química – Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – Universida de São Paulo (Brazil)

Session 2B		
2B	CARVALHO, Sara	Faculty of Sciences, University of Lisbon CCMM, Lisbon (Portugal)
2B	COSTA, Fernanda Madalena	Faculty of Sciences, University of Lisbon CCMM, Lisbon (Portugal)
2B	JARDIM, Maria Estela	Faculty of Sciences, University of Lisbon CCMM, Lisbon (Portugal)
2B	LANGLINAY, Erik	Doctorant, EHESS, Paris (France)
2B	MAUSKOPF, Seymour H.	Professor, Duke University, Durham, NC (USA)

Session 3A		
3A	HOCQUET, Alexandre	École européenne d'ingénieurs en génie des matériaux ; LCPM, CNRS, Nancy et Centre A. Koyré-EHESS, Paris (France)
3A	MAAS, Ad	Curator, Museum Boerhaave, Leiden (The Netherlands)
3A	TADDIA, Marco	"G. Ciamician" Department of chemistry, University of Bologna (Italy)

Session 3B		
3B	ALBRECHT, Helmuth	Director, Chair for Industrial Archaeology and History of Technology Institute for Industrial Archaeology, History of Science and Technology. Technical University Mining Academy, Freiberg (Germany)
3B	BÅRTVEDT, Randi	Director, Norsk Vasskraft- og Industristadmuseum (Nordic Waterpower- and Industrial-Museum), Tyssedal (Norway)
3B	KIERDORF, Alexander	Secretary of the German National Committee of TICCIH, Germany, Cologne (Germany)
3B	ULLRICH, Stefanie	Dipl.-Ind. Arch., Master-Student Industrial Archaeology Program Freiberg Institute for Industrial Archaeology, History of Science and Technology. Technical University Mining Academy, Freiberg (Germany)

Session 4		
4	CHATRY, Gilles	Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER), Service Archives et patrimoine intellectuel (API), Plouzane (France)
4	GLIÈRE, Francine	Responsable de l'unité des fonds et collections Archives départementales de Savoie, Conseil régional, Chambéry (France)
4	LE ROUX, Muriel	Senior researcher, CNRS – Maison française d'Oxford, Linacre College, Oxford (UK)
4	SHEA, Patrick H.	Senior archivist, Chemical Heritage Foundation, Philadelphia (USA)

Session 5		
5	BUD, Robert	The Science Museum, London (UK)
5	FURUKAWA, Yasu	President of the Japanese Society for the History of Chemistry, Professor of History of Science, Nihon University, Kawasaki (Japan)
5	ZAITSEVA (BAUM), Elena	Senior research Assistant, History of Chemistry Section, Faculty of Chemistry, Lomonosov Moscow State University, Moscow (Russia)

Round Table		
RT	ILLIEN, Gildas	Responsable du département Web Archives, BNF. Treasurer of the International Internet Preservation Consortium (IIPC).
RT	POGARELL, Hans-Hermann	Bayer archives, Leverkusen (Germany)
RT	BIERI Alexander L.	F. Hoffmann-La Roche AG Historisches Archiv, Basel (Switzerland) Vice-president of the German group of archivists of the chemical industry (Arbeitskreis Chemiearchivare der Vereinigung Deutscher Wirtschaftsarchivare)

SPEAKERS / ALPHABETICAL LIST

Abbreviations

Ads: Addresses
ES: Special session
OL: Opening lecture
PL: Plenary lecture
RT: Round table

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Bernadette Bensaude-Vincent, Université Paris 1 – Panthéon-Sorbonne, Paris

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Abbreviations

CNFHPS : Comité national français d'histoire et de philosophie des sciences
GHDSO : Groupe d'histoire et de diffusion des sciences d'Orsay
SCF-CHC : Société Chimique de France – Club d'histoire de la chimie

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