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# Historical Group

## NEWSLETTER and SUMMARY OF PAPERS

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**Save the date:** *The handed world, 150 years of molecular  
chirality*: planned for 13 October 2021 in Burlington House – see  
within for details

Mark I. Grossman, “John Dalton’s “Aha” Moment: The Origin of the Chemical Atomic Theory”.

José Ramón Bertomeu Sánchez, “Lead Poisoning in France around 1840: Managing Proofs and Uncertainties in Laboratories, Courtrooms, and Workplaces”.

Theresa Levitt, “Morphine Dreams: Auguste Laurent and the Active Principles of Organised Matter”.

### RSC Booklet on Past Presidents

David Allen from the RSC Library has put together a booklet on the Past Presidents of the Chemical Society and Royal Society of Chemistry to tell the stories of those who have led the organisation.

<https://www.rsc.org/globalassets/02-about-us/our-history/rsc-presidents-1841-2024.pdf>

## SHORT NOTES

### Alice, Kitty and Biochemistry – and a Request to Readers

Lewis Carroll’s *Through the looking-glass and what Alice found there* was published on 27 December 1871 (not in “1872” as indicated inside the book).

Shortly before Alice jumps through the looking-glass from the chimney-piece, addressing her cat Kitty, she speculates, “Perhaps Looking-glass milk isn’t good to drink” [1]. (In 1871 and long afterwards, a pet cat’s staple diet included milk, contrary to modern recommendations [2].)

Like Gardner [3] but *pace* O’Leary [4], the present writer thinks it likely that Carroll was making a “shot in the dark” rather than deploying precise chemical knowledge. However that may be, Alice’s idea that Looking-glass milk was different was confirmed by a line of chemical thought [5] that began in 1860 with Louis Pasteur (1822-1895) and culminated in the independent 1874 publications of Jacobus Henricus van’t Hoff (1852-1911) and Joseph Achille Le Bel (1847-1930). This work established the possibility of optical activity of solutions of compounds CWXYZ with different groups W, X, Y, and Z tetrahedrally disposed about the carbon atom C [6]. No mirror plane passes through the molecule and the mirror image of the molecule is not superimposable on its original, any more than left- and right-hand gloves are superimposable [7]. The two “enantiomeric” forms in solution, for the same concentrations and path lengths, rotate plane-polarised light through equal angles but in opposite directions (now

designated (+) and (–)). Later, Lord Kelvin (1824-1907) coined the term “chirality” (literally “handedness”) for such non-superimposability [8].

To celebrate this work of approximately 150 years ago, the Historical Group is planning (Covid permitting) a one-day meeting in London on Wednesday 13 October 2021 <https://www.rsc.org/events/detail/40046/the-handed-world-150-years-of-chiral-molecules> – as it happens, in the precise sesquicentenary year of *Through the looking-glass*.

Milk contains the C<sub>12</sub> sugar (+)-lactose. Healthy babies – and most adult Northern Europeans – metabolise (+)-lactose to an equimolar mixture of the C<sub>6</sub> sugars (+)-glucose and (+)-galactose by means of the enzyme lactase. But some adults do *not* produce lactase, especially non-Europeans; such people are “lactose-intolerant”, suffering “bloating” and other unpleasant symptoms if they consume milk.

Now, enzymes bind specifically to an active site in the molecule being metabolised. In (+)-lactose, the site will be of a single “handedness”. Therefore, real-world lactase would be unlikely to metabolise the (–)-lactose of Looking-glass milk, just as a left hand fits only uncomfortably into a right-hand glove. If so, even real-world lactose-tolerant people might well get unpleasant symptoms if they drank Looking-glass milk, *ie* as Alice’s speculates, it would *not* be good to drink. In principle, Looking-glass (–)-lactose could be made in the laboratory and experimented with to settle the point; an *in vitro* experiment would at least partially suffice, without risking making someone ill! But the present writer is not aware of this having been done, or even of an enzyme expert predicting authoritatively what the result of such an experiment would be. If any *Newsletter* reader can enlighten the present writer, please can he or she do so? Such information would no doubt be received with acclaim by the audience on 13 October.

### References and Notes

1. Lewis Carroll, *The Annotated Alice – The Definitive Edition*, ed. Martin Gardner (London: Allen Lane the Penguin Press, 2000), 148.
2. John Bradshaw, *BBC Science Focus Magazine*, “Why can’t cats drink milk? Plus 6 other feline myths”, 20 May 2019, <https://www.sciencefocus.com/nature/why-cant-cats-drink-milk-plus-6-other-feline-myths/> (accessed 28 May 2021).
3. Carroll, *The Annotated Alice – The Definitive Edition*, 151-152, Note 6.

4. Joanna Shawn Brigid O'Leary, "Where 'things go the other way': the stereochemistry of Lewis Carroll's looking-glass world", *Victorian Network*, Summer 2010, 2(1), 70-87.
5. J.R. Partington, *A History of Chemistry*, Volume 4 (London: Macmillan, 1964), 755-759.
6. The discussion here applies to pure liquids or vapours as well as solutions, but not to crystals. It excludes special cases such as  $W = CXYZ$ .
7. Non-superimposability is the fundamental condition for optical activity. For  $CWXYZ$ , absence of a molecular mirror plane amounts to the same thing – but not for all molecules, see F. Albert Cotton, *Chemical Applications of Group Theory*, 3rd edition (New York: Wiley, 1990), 34-39.
8. Lord Kelvin, *The Molecular Tactics of a Crystal* (Oxford: Clarendon Press, 1894), 27, footnote 1.

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## SOCIETY NEWS

### Society for the History of Alchemy and Chemistry: Morris Award 2021

The SHAC Morris Award for 2021 has been given to Ernst Homburg for his outstanding work on the history of the chemical industry. His contributions include major studies on the history of the madder industry; his seminal paper on the early history of industrial R&D laboratories; his comprehensive history of twentieth-century modern chemistry and the chemical industry embedded within a broader history of the Netherlands in *Techniek In Nederland in the Twintigste Eeuw*. And, particularly (in the context of this award), his "The Era of Diversification and Globalization (1950-2012)" in *Solvay: History of a Multinational Family Firm* (CUP, 2013), a book he co-edited with Kenneth Bertrams and Nicolas Coupain.

Ernst Homburg has given great service to the history of chemistry community. He edited the *Ambix* book reviews for ten years; served as a member of SHAC Council for twenty years; chaired the Historical Group of the Dutch Chemical Society for twelve years; was president of the Dutch History of Science Society (GeWiNa) between 1995 and

1998; and chaired the Working Party on the History of Chemistry of the European Association for Chemical and Molecular Sciences for six years up to 2009. He was a Professor in the Faculty of Arts and Sciences at the University of Maastricht until his recent retirement.

*The Morris Award honours the memory of John and Martha Morris, the late parents of Peter Morris, the former editor of Ambix and recognises scholarly achievement in the History of Modern Chemistry (post-1945) or the History of the Chemical Industry. The next award will take place in 2024. A call for nominations will be circulated in 2023.*

The HIST Award for Outstanding Achievement in the History of Chemistry for 2021

The Division of the History of Chemistry (HIST) of the American Chemical Society is pleased to announce that Dr Mary Virginia Orna will receive the 2021 HIST Award for outstanding achievement in the history of chemistry "for her exemplary leadership in the worldwide community of the history of chemistry, especially for her original research in the area of colour and pigment chemistry and the discovery of the elements, her commitment to education, her decades of service to the Division of History of Chemistry, and her continuing role in supporting and participating in the worldwide research in the archeology of chemistry".

Sister Dr Orna joined the College of New Rochelle (New York) in 1966 and is now Professor of Chemistry Emerita. Although she is being honoured for her contributions to the worldwide community of historians of chemistry, she has devoted her life first to her Ursuline order and to her students, both in her own college and in the rest of the world. She has received many awards for her devotion to chemical education and continues her efforts to inform and educate the world about Chemistry through her NSF spin-off enterprise, ChemSource. She has devoted her technical career to the study of colour and its role in human culture and been a champion of the Archaeological Chemistry community.

### Citation for Chemical Breakthrough Award to UCL

Since 2006, the Citation for Chemical Breakthrough Award programme, administered by the ACS Division of the History of Chemistry, has honoured scientific publications, books and patents that have been revolutionary in concept and broad in scope, and that forever changed the face of chemistry. In 2020 a plaque was presented to the Chemistry Department of University College London for Professor William