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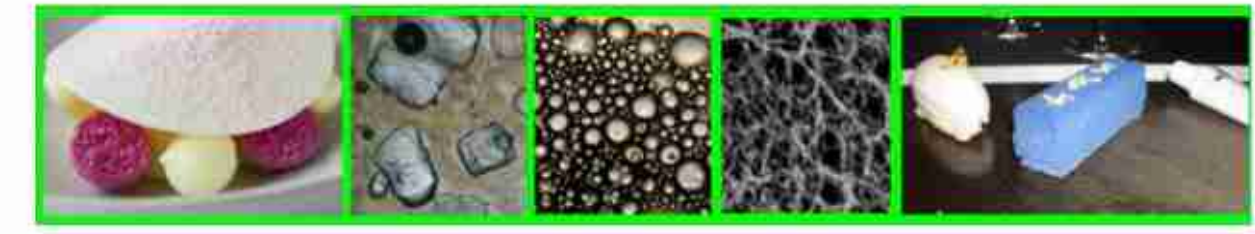

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Book Review

Food Chemistry in Small Bites

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Abstract
Review of the book *Food Chemistry in Small Bites*, by Patricia O'Hara. University of California Press, Oakland, California. 260 p.
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In classic book reviews, the book is first presented, with its various parts, before these are evaluated. But isn't it predictable and boring? And who is really able to ''judge'' the quality of a book, except regarding the accuracy of the information given? I prefer to first take advantage of the publication of Patricia O'Hara's new book to discuss the history of books relating to molecular and physical gastronomy, in order to better explain the exact content and interest of the new book.
In the second half of the 20th century, the French microbiologist Edouard de Pomiane published a series of bestsellers (*Radio Cuisine, La physique de la cuisine et son art*, etc.), in which he discussed cooking, seeking physicochemical interpretations. Unfortunately, he relied on personal interpretations, and not enough on experimental results and real scientific investigation. For example, he mentioned a hypothetical "battery effect" that would have been imposed for beating egg whites (between a copper basin and an iron wire whisk), and he also repeated wrong ''culinary precisions'' without having tested them. He confused the natural sciences with their technical applications, and imagined a strange chimeric discipline that he called "gastrotechnie", which we cannot easily understand whether it is a rational and precise way of cooking, or a scientific study (in the sense of the natural sciences).
Later, there were more accurate books, such as *Cuisine et molécules* (Cooking and molecules), by the physicist Jean Matricon, *On food and cooking*, by the food writer Harold McGee, or my own *Secrets de la casserole* (The science of the oven), *Révélations gastronomiques* (Gastronomic revelations), etc.

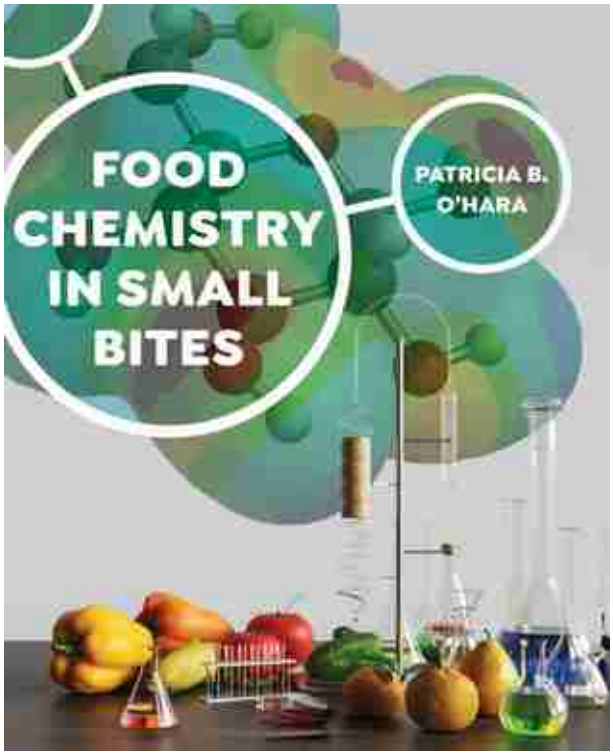
The wave of books on "molecular cooking"

Thirdly, after the explosive development of the scientific discipline that Nicholas Kurti and I named molecular and physical gastronomy, the simultaneous promotion of "molecular cuisine" gave rise to a wave of publications aimed at the culinary world, in the various languages of the world.
Molecular cooking is the technical way of

cooking using tools imported from laboratories, such as pumps, thermocirculators, liquid nitrogen, rotary evaporators and decanting bulbs (This, 2022). I advocated it in particular through the European Programme Inicon (funded under FP5), which was also an opportunity to promote the use of gelling agents then unused by Western chefs, such agar-agar, sodium alginate, carrageenan, etc. Soon ‘’degennes’’ (i.e. reproduction of caviar made from sodium alginate and calcium salts), ‘’florys’’ (gelled spaghettis), foams from siphons or smoking preparations (made using liquid nitrogen) became the hallmark of molecular cuisine, the new culinary style based on molecular cooking, that spread all over the world in fine dining restaurants (This vo Kientza *et al.*, 2021).
At first, these proposals were received with great caution, even resistance, by part of the culinary world, but the ‘’mad cow’’ crisis helped to catalyse the introduction of ‘’new’’ gelling ingredients in restaurants, to the point that, today, they are sold in supermarkets, and sometimes confused with gelatin. Some even speak of ‘’plant gelatin’’, which is an oxymoron as gelatin is an animal product (the substance produced after the partial degradation of collagenic tissue in hot water); about new gelling agents, one should speak more precisely of … gelling products extracted from plants or algae.
And these developments led to the publication of a lot of other books, in various languages, by scientists, technologists or chefs.

Molecular and physical gastronomy in Education

As the public interest was sparked, professors and students were also attracted by culinary innovation, and such interest became useful, because it could be the basis of a modern and appealing ways of showing some physics (gelification, thermal conduction, for example) and chemistry (polysaccharides, proteins, etc.). As a result, in science museums, universities, and schools (from primary schools to high schools), educational programmes based on molecular and physical gastronomy have been developed. Some are shown in the second part of the Handbook of



Molecular Gastronomy, of which Patricia O’Hara is an author of one chapter (O’Hara, 2021).

Molecular and physical gastronomy for teaching chemistry

Now, this new book by Patricia O’Hara, about *Food chemistry in small bites* (2025), is one of a new series of books for a young audience. It is to be welcomed if molecular and physical gastronomy help students to appreciate the beauties of chemistry!
I must confess that, generally, when I am reading a text by an American colleague, I am anxious about the possible confusion between ‘’molecular and physical gastronomy’’, on the one hand, and ‘’molecular cooking’’ (or ‘’molecular cuisine’’) on the other hand, because, in spite of my efforts, the wrong use of the name of our scientific discipline (‘’molecular and physical gastronomy’’, sorry to insist) was diverted to cooking. The root of this mistake dates back in 1992, when Kurti and I organized the first International Workshop on Molecular

and Physical Gastronomy, in Erice (Sicily, Italy). At that time, in order to be sure of analysing the right phenomena, we invited chefs along with scientists, and the event was so successful that a lot of journalists came to the second workshop, held in 1995. The chefs there became wrongly associated with molecular and physical gastronomy, so that, in 1999, during an event attended by both scientists and chefs in Paris, I had to coin the expression ‘’molecular cooking’’ to make the difference between the scientific activity and the culinary one. However, it was too late. In particular in America, in spite of numerous attempts, the confusion remained, while I succeeded to make the difference clearer in many other countries. Even recently, users of the social medium Bluesky have been speaking of ‘’molecular gastronomy’’ restaurants. Often, these people confuse sciences of nature and their applications, because they believe - as did the French chef Auguste Escoffier - that it is enough to be rigorous to be "scientific" (in the sense of natural sciences).

I hasten to add that, in O’Hara’s book, the confusion is avoided, first because she knows well the difference, but also because she focuses more on food chemistry in general, rather than simply on molecular and physical gastronomy. For example, the book begins with adenosine triphosphate (ATP) and physiological questions: what do we eat ? Food transformation comes only in Part 2 (heat, pressure, pH, consistency), before the question of the future of food is discussed, in particular in the context of food security and climate change, finishing with note by note cooking (Part 3). The last part, ‘’Performing culinary explorations’’, proposes exercises and experiments to show how food can be transformed using the techniques explored in the preceding chapters.

With this book, as with others that are not written by myself, I am always curious to observe how colleagues deal differently from me with the same material as the one in which I am interested. For sure, this book is far away from what I would have done: I would have focused it entirely on culinary phenomena, and, more precisely, I would not have ‘’covered’’ a particular curriculum (because I don’t need to). But what Patricia O’Hara did is certainly more appropriate to the particular audience that she is targeting ; in the very beginning of her book, she recognizes that she was led to making this book by students of her at Amherst college, where she is Amanda and Lisa Cross Professor of Chemistry, Biochemistry, and Biophysics. And as she also recognizes the encouragement of her late husband Richard Blatchly, it gives me the opportunity to indicate that this book is full of useful modern representations of molecules, well calculated (by him) using a molecular modelling and computational program, which generated the surface charge models, a welcome input in modern chemistry teaching.

For sure, students who were involved in the very origins of this book can be happy and proud of this exciting and useful new publication from our colleague Patricia O’Hara.

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