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During the cycle of conferences organised by the Department of Chemistry at the Universitat Autònoma de Barcelona, Pere Castells was one of the highlights among the presenters and we have taken advantage of this opportunity to interview him. As Head of the Department of Gastronomic and Scientific Research of the Alícia Foundation, and also well-known for his work with Ferran Adrià at the restaurant “El Bulli”, Pere Castells tells us how science is already a great tool for bringing the avant-garde into the kitchen, and not just on a creative level, either. Improvements in the preparation of some products, such as fried food, and the discovery of new flavour, are just two examples of everything that science can offer to gain a greater mastery and understanding of culinary processes. Parallel to this, university and research centres, R+D+I institutions and the agricultural and food sectors have become more interested in the relationship between science and cooking.

Pere Castells earned his degree in Chemical Sciences with a specialisation in Organic Chemistry from Universitat de Barcelona. In 1980 he began his career teaching at the secondary school Molí de la Vila in the town of Capellades and went on to become its headteacher from 1991 to 2000. During the years he spent teaching, Castells also directed several research projects, many of which won the CIRIT Award for projects carried out by secondary school students.
He has participated in and taught scientific training courses and has been a member of various research groups focused on educational projects in Europe. He is coordinator and author of secondary school books on Chemistry. Since 2003 he has collaborated with the research team from El Bulli Taller, Ferran Adrià's creative workshop. In 2004 Castells was named Head of Fundació Alícia's Gastronomic and Scientific Research Department. He collaborated in the drafting of The Scientific and Gastronomy Lexicon which was published in 2006. His research has focused on issues related to textures, to introducing technology into the culinary arts, and to the dissemination of culinary-related science. In the past few years his work in the scientific and culinary fields has focused on creating a new style of work between scientists and chefs in order to make joint progress in gastronomic and scientific research.

For those who have not heard of the concept, what does Molecular Gastronomy mean? It is a term that could confuse people and has, at times, generated controversy.

Molecular Gastronomy symbolises scientific study to explain culinary phenomena, but it was never intended to evolve within the kitchen. Therefore, grouping together situations of science and of cooking under this title doesn't seem right to me. In any case, it is a media name and probably won't disappear. In fact, we have reached the point where we already associate it with Ferran Adrià and the other chefs who apply scientific concepts in their cooking, even though they do not agree. Molecular Gastronomy or Molecular Cooking does not exist as a culinary movement so that science becomes just another complementary cooking tool.

What exactly do you do in your research centre, then?

We prefer to say that we do science and cooking. We apply scientific methodology and concepts to the culinary process, such as noting down temperatures and measures or establishing systematic reproducibility; in other words, how to ensure that a process can be repeated in exactly the same way, among other things, obviously.

Give us an example. I have heard of the discovery of a fifth basic taste, the umami…

Scientists have been convinced for a long time that a fifth basic taste exists, apart from the classics that we are always taught – sweet, salty, bitter and acidic. The umami is associated with a molecule called Monosodium Glutamate and it is independent. In other words, it does not complement any other taste. If there are any more, we still don't know about them! When experts or students come to the Alícia Foundation we make them taste it, because if you cannot taste or visualise it you cannot understand it. It is the taste we associate with soy sauce, broth, the final note of parmesan cheese, and so on. All of them have connotations of umami and for that reason it is know as an Asian flavour.

And is the application of scientific parameters to cooking a recent thing?

Very recent. I am talking about the 21st century. Previously there were few processes used for the advancement of cooking, but it has been subjected to interpretation and divulgation. It is closely linked to the figure of today's great chefs such as Ferran Adrià and Joan Roca, who have needed to use science to open up new pathways in gastronomy. It has been a very quick, almost violent, process, and one which has generated some difficulties in its assimilation.

This sudden introduction could be the reason for all the media discussion that exists between traditional and modern cooking. What do you think about that? Could the science and cooking that you are developing pose a threat to the survival of more popular gastronomy?

That is a media discussion. We have nothing to do with that. Right now, one of our most important studies involves fried foods. How can we catalogue it? As traditional or futuristic cooking? Does it involve more hours in the kitchen? If we enter into those areas instead of considering the products and how to value them, the importance of giving them different textures, what the cooking of the future will be like and how we can ensure that future generations eat better, then we are not taking our country forward at all. For example, it is as important to make cooking broth today as it was 200 years ago? It is certainly possible, but it is obvious that what we can also do it place parameters as to how to make the broth. And if it is good, then no problem,, we will carry on making it like that! In fact, the director of the Foundation is an expert in traditional cooking and he makes us work using many of the classical parameters for cooking. Or do we have to limit ourselves to the use of certain pieces equipment – such as the microwave – which is not accepted in traditional cookery? I don't think that makes sense.

And what is the culinary philosophy of the Alícia Foundation?

The Alícia Foundation is a unique reference centre in the world, where scientists and chefs carry out research into cooking and eating habits. However, without the support of the great chefs such as Ferran Adrià it would not have been possible to create such a centre. It is also important to remember that we are not investigating haute cuisine, but using it as a starting point to promote the possibilities for cooking for social applications: hospital menus, children's menus, healthier fried food, special menus for diabetics...that is our great aim and what we are working towards.

Do you think that this way of applying chemistry to gastronomy could provide a good learning approach to scientific disciplines for future students?

One of my priorities has always been, and I have often been attacked for it, to teach science through cooking because it is what we have close at hand. Universities such as Harvard are also trying to do the same. On a world scale, they are concerned about the way in which science is made public so as to make it intelligible. And I think that from the world of cooking this is very interesting and relatively easy. For example, using cava to explain the behaviour of gases or mayonnaise to explain emulsions greatly simplifies the chemical explanation.

And have you put it into practice?

We are doing so at the Alícia Foundation through workshops for students, and according to the questionnaires, the concepts are being understood. However, we are ambitious and we are

currently in contact with the Department of Education in the search for more teaching resources for explaining science through cooking. We will have to wait. But I defend the idea wholeheartedly and I believe that we have the elements to be able to do so.

And from a scientific point of view, what have the latest contribution of science to cooking been?

Apart from systematising the chefs in the kitchen – now they note everything down – the main contribution of science has been precision: control of temperatures, timing and many other scientific parameters. It has also affected more specific things: the use of new products, such as gelling agents made form algae, and new apparatus, all based on scientific, or if you like chemical, concepts. It is a revolution that has enabled cooking to evolve enormously in recent times and has generated a whole new gastronomic movement, under the wing of our great chefs of course.

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