

ETTORE MAJORANA CENTRE FOR SCIENTIFIC CULTURE,  
ERICE, SICILY  
Director A. Zichichi

# International Workshop on Molecular Gastronomy «N. Kurti»

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**5-10 May 2001**  
**5th Meeting (IWMG 01) on**

**Textures of food : how to create them**

Sponsored by : Italian Ministry of Education, Italian Ministry of University and Scientific  
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# Purpose of the Workshop

*« La découverte d'un mets nouveau fait plus pour le bonheur du genre humain que la découverte d'une étoile »* (The discovery of a new dish does more for the happiness of the human race than the discovery of a star)

Jean Anthelme Brillat Savarin (1755-1826)

Writing about the application of the chemistry to the art of cookery :

*« In what art or science could improvements be made that could more powerfully contribute to increase the comforts and enjoyments of mankind »*

Sir Benjamin Thompson, Count Rumford, (1753-1814)

The object of this workshop will be to bring together a group of reputable chefs de cuisine and scientists to discuss collectively the science behind the practices carried out in the kitchen.

Previous workshops have been held on the role of emulsions, the effects of cooking methods on food quality and the management of food flavours. The 5th IWMG « N. Kurti » will discuss the creation of textures in food.

The above quotations from the writings of two founders of culinary science express in a nutshell the spirit and the objectives of the Workshop : the emphasis will be on gastronomy rather than nutrition, on domestic and restaurant cooking rather than industry.

May we also point out that, as the name IWMG « N. Kurti » indicates, this is a workshop and that participants are encouraged to make use of the kitchen (near the lecture room) which is reasonably well provided with both culinary and scientific equipment.

## Nicholas Kurti (1908-1998)

Nicholas Kurti was born in Budapest (Hungary), 14 May 1908, and educated there in the same Gymnasium as Edward Teller and other famous scientists... Typical of his early years in Budapest was his desire to study music. But as a result of anti-Jewish laws, he had to study in Paris first and then in Berlin. There he worked for a doctorate under Franz Eugen Simon. The two men became close collaborators, but -both being Jewish- they prudently decamped upon

the rise of Hitler, finding refuge at the Clarendon Laboratory in Oxford (1933-1940).

There they followed their research in magnetism and low temperature physics, but, at the outbreak of war, they worked on the atomic bomb project (they were not regarded as sufficiently secure to participate to radar studies). Back at the Clarendon in 1945, Nicholas Kurti and Simon used magnetism to obtain the lowest possible temperatures. They invented the nuclear adiabatic demagnetization method in 1956.

Nicholas Kurti did not stand at that point. As he was rising to professorship of physics in Oxford, to fellowship of Brasenose College (he was also visiting professor in many universities all around the world, member or head of more than 20 scientific committees or organization, where he brought his clear point of view), he worked on history of science, science policy, applications of thermodynamics to energy. Obviously he received many honours appropriate to such a tremendous amount of work and care : he was member of a dozen academies and he got prizes as the Holweck Prize (British and French Physical Societies), the Fritz London Award, the Hughes Medal...

Then, after the 1970's, he became interested in what was later called Molecular Gastronomy

He never gave explicit advices. Except one : « Let us have a simple experiment ».

*« It is a sad reflection that we know better the temperature inside the stars than inside a soufflé ».*

(Nicholas Kurti)

# Time table

## Saturday 5 May :

Arrival in Erice by 18.00 at the latest (if possible).

After dinner informal get-together with Marsala and local delicacies.

## Sunday 6 May :

### Opening sessions

10.00-10.20 : In memory of Nicholas Kurti, by Hervé This.

10.20-11.10 : Introduction by Jon Prinz : Food Feeding and ME (ME = Masticatory Efficiency)

11.10-12.00 : Introduction by Heston Blumenthal and Peter Barham : Molecular Gastronomy at the *Fat Duck*.

*To be followed by Champagne refreshment and Lunch*

15.00-16.30 : Texture changes during cooking

Discussion Leaders : David Kilcast and Anne-Marie De Gennes

The terminology of texture (mouth-feel, etc.)

How can we correlate texture with physical measurements?

16.30-17.00 : *Coffee break*

17.00-18.30 : Texture and flavour

Discussion Leaders : Hubert Richard and Elizabeth Thomas

Relationship between texture and flavour ; an introduction (to be continued in other sessions)

## Monday 7 May

### Texture of Meats I

09.15-10.30 : Temperature and temperature gradients in meat cooking

Discussion Leaders : Harold Mc Gee and Robin Heath

Is there an ideal temperature (« succulence point »)?

How does the cooking temperature affect texture ?

Perfection of texture

From theory to practice : How chefs do it

Meat crust, how to improve it?

10.30-11.00 : *Coffee break*

11.00-13.00 : Tenderness and juiciness of meats

Discussion Leaders : Eric Dransfield and Heston Blumenthal

How to increase the "juiciness" and "tenderness" of meat?

Is it possible to get a tender and juicy meat from any kind of meat?

From theory to practice : results of experiments in slow cooking of meat - advantages and disadvantages.

From theory to practice : effects on tenderness of cooking in a wet medium : tajine, braisés, brick cooking, lutage.

*To be followed by Champagne refreshment and Lunch*

### Texture of Meats II

15.00-16.30: Effect of various treatments

Discussion Leaders : Bernard Launay and Fritz Blanck

Does basting affect the texture of meat?

Does fat injection into meat improve the tenderness? And cooking in oil?  
Chemical modifications of the texture : with salt, acids, polyphenols, etc.

*16.30 -17.00 : Coffee break*

17.00-18.30 : Experiments and practice  
Discussion Leaders : Beatrice Palma and Andreas Viestad

From theory to practice : Experimental tasting of meats marinated in different ways.  
Which process for which texture?  
Double cooking.

## **Tuesday 8 May**

### **Texture of vegetables and fruits I**

09.15-10.30 : Vegetable cooking : which cooking process for which texture?  
Discussion Leaders : Len Fischer and Christian Conticini

Slow cooking of vegetables : is it always possible?  
Which conditions are more appropriate to which vegetables?  
How do chefs cook vegetables ?  
Making vegetable tender.  
How to cook the green vegetables to make them tender?  
Cooking roots : carrots, turnips...  
From theory to practice : Experimental session tasting of root vegetables cooked in different ways

*11.00-11.30 : Coffee break*

11.30-12.45 : Boiling vegetables : a bad method?  
Discussion Leaders : Vanessa Van Zant and André Gervat

The case for thermal shock in vegetable cooking : how does it affect texture?  
Experimental investigations of thermal shock cooking

*To be followed by Champagne refreshment and Lunch*

### **Texture of vegetables and fruits II**

15.00-17.00 : Cooking vegetables in a microwave oven  
Discussion Leaders : Jean Matricon and Leslie Forbes

Effect on texture  
From theory to practice : Experimental investigations of microwave cooking  
Texture and colour

*17.00-17.30 : Coffee break*

17.30-18.30 : Chemical processes  
Discussion Leaders : Hervé This and Tamasin Day Lewis

Texture modification by : calcium salts, pH, ionic strength  
Cooking vegetables in fat : effect on textures  
From theory to practice : Experimental investigations of the role of fat in cooking vegetables

## **Wednesday 9 May**

### **Textured preparations, pastry**

09.15-10.30 : Purées and Mousses  
Discussion Leaders : Ugo Palma and Gerard Coleman

Parameters that control the texture of purées

Parameters that control the texture of mousses

*10.30-11.00 : Coffee break*

11.00-12.00 : Hachis, and gels

Discussion Leaders : Alan Parker and Hanna Kapitulnik

Parameters that control the texture of hachis

Parameter that control the texture of gels

*To be followed by Champagne refreshment and Lunch*

15.00-17.00 : Textures in pastry

Discussion Leaders : Shirley Corriher and Davide Cassi

The control over dough texture

The control over the texture of pastry mousses ; effects on mouth-feel

The control over pastry gel (jams, gelatine gels, other gels) texture

*16.30-17.00 : Coffee break*

17.00-8.00 : How to get special textures

Discussion Leaders : Peter Barham

The crackling is superb, but how to get it?

## **Thursday 10 May**

09.15-10.45 : Stock taking and future plans.

Departure.

# List of participants :

Workshops, schools and conferences in Erice are usually devoted to a well defined discipline or subject. Participants usually know each other, even if not personally at least through their work.

Ours is a heterogeneous gathering and we have therefore tried to indicate in a few words participant's interests, professions, positions, etc. Where the work of participants is described simply as « Writer », « Teacher », or « Author » it is understood to be relevant at least partly to the theme of the Workshop.

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