Magnetrons, Microprocessors and the Birth of Expert Cooking Intelligence

International Microwave Power Institute
Annual Symposium Orlando FL USA
June 23, 2016

Steven J. Drucker
Droaster Laboratories LLC
Atlanta GA USA

Steve.Drucker@InfinityOven.com

© Droaster Laboratories LLC 2016
The Birth of Expert Cooking Intelligence

What is expert cooking intelligence?

Youtube.com “The Honeymooners”
The Birth of Expert Cooking Intelligence

Is the pursuit of expert cooking intelligence a quest for the grail that’s uniquely American?
Expert cooking intelligence—yesterday, today and tomorrow
Method of Investigation

- Historical contexts
- Innovations in and out of the house
- Magnetrons, microprocessors and TV dinners
- Computing in our pocket and appliances that learn
The Birth of Expert Cooking Intelligence

Introduction
Magnetrons
Microprocessors
Expert cooking intelligence
Think tubes vs. transistors

The Birth of Expert Cooking Intelligence

Analog magnetron tube etc.

Solid state microwave generator

electronics.stackexchange.com; todayIFoundOut.com; electronicdesign.com
The Birth of Expert Cooking Intelligence

Microprocessor + Memory = “Microm”

http://fan.lib.ru/z/zharow_a/evolution_continues.shtml
The Birth of Expert Cooking Intelligence

Expert cooking intelligence—push button, get food?

"How many times have you wished you could push a button and find your meals deliciously prepared and served, and then as easily cleared away by the snap of a switch?"

When was it said?

1900 1925 1950 1975 2000 or 2015?
Who said it?

"How many times have you wished you could push a button and find your meals deliciously prepared and served, and then as easily cleared away by the snap of a switch?"

Yummly  Betty Crocker  Julia Child
Thomas Edison  Marie Callender  Stephen Hawking
Cooks Illustrated, Popular Science, Good Housekeeping?
The Birth of Expert Cooking Intelligence

"How many times have you wished you could push a button and find your meals deliciously prepared and served, and then as easily cleared away by the snap of a switch?"

Good Housekeeping

1930
1796

The first American cookbook

AMERICAN COOKERY

http://muse.jhu.edu/article/10494
Society of equals coalesces as a nation and a sensed community through food

“...celebration of nationhood through food may, of course, be construed as a political act...she reminds her readers of the reasons underlying the War of Independence and celebrates an emerging sense of American nationhood.”
1820 to the Civil War

Kitchen. Open fire, hand pump

Bathroom. Not yet

Sewers flow untreated into local waterways

Communications and transportation networks take root between towns and cities

Expert cooking intelligence: Cookbooks aplenty, but...
1824

“The Virginia Housewife”
The first modern cookbook

- First detailed recipes
- Broad breadth of recipes
- Recipes available on an equal basis to everyone

1835, 1840

“De La Démocratie en Amérique”, Volumes I and II Alexis de Tocqueville, (“Democracy in America”)

“Americans...constantly form associations”

“Wherever at the head of some new undertaking you see the government in France, or a man of rank in England, in the United States you will be sure to find an association”

“In democratic countries the science of association is the mother of science”

http://xroads.virginia.edu/~HYPER/DETOC/ch2_05.htm
1835, 1840

Community formation thrives in a society of equals

“is there in reality any necessary connection between the principle of association and that of equality?”

ibid
Post Civil War

- **Kitchen**: Cast iron sink, open fire, wood and coal fired stoves
- **Heat and light**: candles, whale oil. Kerosene becomes cutting edge, Standard Oil starts eras of trusts
- **Doctors**: neither license nor diploma required
- **Boston**: 700 horses per square mile, 40 to 50 pounds of manure daily
- **Population**: 75% rural, 60% under age 25
- **Diet**: mainly pork and starch. Per capita annual pork consumption 130 pounds. Few vegetables

http://www.nytimes.com/2016/05/15/upshot/what-was-the-greatest-era-for-american-innovation-a-brief-guided-tour.html?module=ArrowsNav&contentCollection=The%20Upshot&action=keypress&region=FixedLeft&pgtype=article
Post Civil War

Bathrooms. *Still* not yet. Untreated chamber pots into streets into sewers and out to waterways
Post Civil War

- Cross country communications and transportation networks blossom
- 0.9 newspapers per day for 40 million people
- Invention of can opener (1858) and change to steel then tin from wrought iron enable processed food revolution
- Processed food industry mushrooms in response to European and U.S. military supply market demands
- Higher incomes, increased urbanization and growing middle classes increase domestic U.S. processed food demand decade by decade.
Post Civil War

Processed foods are the first universally available tangible expression of expert cooking intelligence

To chronicle the revolution: consumer communication
Post Civil War

Q: What exactly about its audience caused Good Housekeeping’s circulation to climb above 250,000 by the time of its sale to Hearst in 1911?
“The passion for physical comforts is essentially a passion of the middle classes; with those classes it grows and spreads”

Alexis de Tocqueville, Democracy in America, Volume II, 1840

http://xroads.virginia.edu/~HYPER/DETOC/ch2_10.htm
“The love of well-being has now become the predominant taste of the nation”. *ibid*

Q. Is the quest for expert cooking intelligence uniquely American?
A. YES.
1901. Pan American Exposition.

Population shifting to urban from rural

"For Health's Sake, Eat Ralston". Ralston / Purina Mills Ad. Source: *Cosmopolitan*, vol. 31, no. 5 (September 1901)
When Hunger Comes—

as it is wont to do with persistence and regularity in every clime—what is so welcome, so wholesome and satisfying as a delicious dish of

Van Camp's

Boston Baked PORK AND BEANS
Prepared with Tomato Sauce.
Ready in a moment—good hot or cold. Send 6 cents in stamps for sample can. Booklet free.

VAN CAMP PACKING CO.
802 Kentucky Ave., Indianapolis, Ind.
Van Camp's Concentrated Tomato Soup—best, purest. One can makes a quart of rich soup.

CAMPBELL'S
"BEFESTEAK"

TOMATO
SOUP

JOSEPH CAMPBELL PRESERVE CO.
Camden, New Jersey
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1872</td>
<td>Blackjack chewing gum</td>
</tr>
<tr>
<td>1876</td>
<td>Premium soda crackers (later Saltines)</td>
</tr>
<tr>
<td>1881</td>
<td>Pillsbury flour</td>
</tr>
<tr>
<td>1886</td>
<td>Coca-Cola</td>
</tr>
<tr>
<td>1887</td>
<td>Ball-Mason jars</td>
</tr>
<tr>
<td>1888</td>
<td>Log Cabin syrup</td>
</tr>
<tr>
<td>1889</td>
<td>Aunt Jemima pancake mix</td>
</tr>
<tr>
<td>1889</td>
<td>Calumet Baking Powder</td>
</tr>
<tr>
<td>1889</td>
<td>McCormick Spices</td>
</tr>
<tr>
<td>1889</td>
<td>Pabst Brewing Company</td>
</tr>
<tr>
<td>1890</td>
<td>Knox gelatine</td>
</tr>
<tr>
<td>1890</td>
<td>Libby introduces keys to canned meat</td>
</tr>
<tr>
<td>1890</td>
<td>Lipton tea</td>
</tr>
<tr>
<td>1891</td>
<td>Del Monte</td>
</tr>
<tr>
<td>1891</td>
<td>Fig Newton</td>
</tr>
<tr>
<td>1891</td>
<td>Quaker Oats Company</td>
</tr>
<tr>
<td>1893</td>
<td>Cream of Wheat</td>
</tr>
<tr>
<td>1893</td>
<td>Good &amp; Plenty</td>
</tr>
<tr>
<td>1893</td>
<td>Juicy Fruit gum</td>
</tr>
<tr>
<td>1894</td>
<td>chili powder</td>
</tr>
<tr>
<td>1895</td>
<td>shredded coconut</td>
</tr>
<tr>
<td>1895</td>
<td>Triscuits</td>
</tr>
<tr>
<td>1896</td>
<td>Cracker Jack</td>
</tr>
<tr>
<td>1896</td>
<td>Michelob beer</td>
</tr>
<tr>
<td>1896</td>
<td>S&amp;W canned foods</td>
</tr>
<tr>
<td>1896</td>
<td>Tootsie Roll</td>
</tr>
<tr>
<td>1896</td>
<td>Bell's condensed soup</td>
</tr>
<tr>
<td>1897</td>
<td>Campbell's tomato soup</td>
</tr>
<tr>
<td>1897</td>
<td>Grape Nuts</td>
</tr>
<tr>
<td>1897</td>
<td>Jell-O</td>
</tr>
<tr>
<td>1898</td>
<td>Nabisco graham crackers</td>
</tr>
<tr>
<td>1898</td>
<td>shredded wheat cereal</td>
</tr>
<tr>
<td>1899</td>
<td>Wesson oil</td>
</tr>
<tr>
<td>1900</td>
<td>Chiclets gum</td>
</tr>
<tr>
<td>1900</td>
<td>cotton candy</td>
</tr>
<tr>
<td>1900</td>
<td>Hershey's chocolate bar</td>
</tr>
<tr>
<td>1901</td>
<td>instant coffee</td>
</tr>
</tbody>
</table>

http://www.foodtimeline.org/
1891. Thomas Crapper updates the modern toilet with his patented valve-and-siphon design.
Pre World War I:

- Max Ams Machine Company patents the modern double-seam canning process, 1904
- Modern toilets become the rule
- Piped gas for lighting everywhere, it’s widely available for cooking too.
- Good Housekeeping Research Institute 1910
- Oven thermostat patented 1915
1920 Post World War I:

Gas ranges overtake coal

60% of homes electrified

Pop up toaster 1919

51% of country urban vs 23% in 1870

http://www.greatachievements.org
http://www.nytimes.com/2016/05/15/upshot/what-was-the-greatest-era-for-american-innovation-a-brief-guided-tour.html?module=ArrowsNav&contentCollection=The%20Upshot&action=keypress&region=FixedLeft&pgtype=article
Post World War I:

The most profound change since 1870

The Connected Home

✓ Electricity and gas
✓ Water and sewer
✓ Radio

http://www.nytimes.com/2016/05/15/upshot/what-was-the-greatest-era-for-american-innovation-a-brief-guided-tour.html?module=ArrowsNav&contentCollection=The%20Upshot&action=keypress&region=FixedLeft&pgtype=article
1920 Post World War I:
Price of nails drops by a factor of 10 since 1830
3 newspapers daily per capita
556 radio stations by 1923; cars, cars, cars
1930:
Expert cooking intelligence informs success in marriage

http://library.wustl.edu/how-to-have-the-perfect-marriage/
1933:

Expert cooking intelligence and the middle class suffer during economic setbacks
1938. Refrigerator, air conditioning, electric power, light, electric accessories, prefabricated kitchen and bathroom utensils.

http://www.yale.edu/ynhti/curriculum/units/2008/3/08.03.04.x.html
http://www.retrorenovations.com
Expert Cooking Intelligence—innovations

1945

WITH NEW G-E "SPEED COOKING"
YOU (AND YOUR KITCHEN) WILL SHINE!

http://www.GE.com
1950’s
Lots of smoke, but for expert cooking intelligence not much changes until...
1953
520,000 lbs of leftover post-Thanksgiving frozen turkey, a slogan bearing salesman and voila…TV Dinners!

http://pinnacle.com;
Expert cooking intelligence mid-century origins

Percentage of Americans today who regularly watch television while eating dinner: 66% (A.C. Nielsen)
1967. General Electric introduces the **first** electronic oven control.

From here on in, **microprocessors** are increasingly incorporated into kitchen appliances.

Recipes and microprocessors link up from the start.

1970 vs 1940

- Planes, trains, automobiles, phones and interstate highways connect everyone and everywhere
- Electric light 100% of homes, up from 79%
- Running water 98% of homes, up from 74%
- Refrigerators 100% of homes, up from 44%
- Canned vegetables 93 lbs annual per capita, up from 34 lbs
- Microwave ovens 1965 $495, by 1986 $191

http://www.nytimes.com/2016/05/15/upshot/what-was-the-greatest-era-for-american-innovation-a-brief-guided-tour.html?module=ArrowsNav&contentCollection=The%20Upshot&action=keypress&region=FixedLeft&pgtype=article
1996

Microwave ovens in 92% American homes (A.C. Nielsen)

Microwave frozen food market suffers from consumer pushback against lack of quality

TV Dinners evolve into microwave ready frozen entrees, side dishes and family size meal components
1998: in pursuit of the grail
Microwave Ovens—buttons, buttons and more buttons.

Buttons, enabled by microprocessors, proliferate.

Consumers’ eyes glaze over.
1998: in pursuit of the grail

“.You argue about which buttons to include, when you could have an infinite number of buttons”

Personal communication, microwave manufacturer product planning meeting March 1998 west of the Hudson
April 4, 2002

FROM THE DESK OF DAVID POGUE

When Conceiving New Products, 300 Brains Are Better Than One

By DAVID POGUE

My column in last week's Circuits featured nine ideas for high-tech products that don't exist but should.

Once again, your e-mail messages and letters to the editor show that 300 brains are mightier than one...

Finally, I described something called Microwave Plus+, whose electric eye would scan special food-package bar codes for perfect microwave cooking.

"Getting new technology to market can often be like herding cats," he wrote.

But TrueCookPlus, the product of his company's labors, will finally come to market this year.

Mr. Drucker adds that several major food packagers have already agreed to print the necessary codes.

Steve Drucker, chief executive of Microwave Science, e-mailed to say that his company has developed a similar

That's one great product that doesn't exist -- but will.
Magnetrons, microprocessors and packaged food—an operating system to cook everything perfectly

A “push button” “get food” microwave oven grail moment?
21st Century expert cooking intelligence
consumer communications

http://www.youtube.com
http://www.cnet.com
Today

- Expert cooking intelligence lags in microwave ovens in a price commoditized MWO marketplace
- Microwaved packaged food perceived as lesser quality and nutritional value
- Microwaves of the future garner buzz with internet downloaded recipes on their LCD displays
- Consumers prefer their phones and tablets over “leaning in” to their microwave oven, stove and refrigerator door displays
Expert Cooking Intelligence—yesterday, today and tomorrow

Tomorrow: a grail of another color

Clearwave™ see through microwave oven doors
The future is clear™

https://www.youtube.com/channel/UCiZLxQCzAqdYXUFuDUhWkdA
The Future of Expert Cooking Intelligence

- Recipes will underlie the pursuit of expert cooking intelligence
- Cloud based expert cooking intelligence will deliver recipes on steroids
- Microwave recipes pro’s: speed
- Microwave recipes cons: perceived food quality
- Digital magnetrons will further empower smart microwaves
Conclusions

- The pursuit of expert cooking intelligence is a uniquely American quest for the grail

- Expert cooking intelligence is mutable. It’s nature changes and evolves in response to cultural trends and technology innovations

- Cloud based expert cooking intelligence is the future
WAIT—there’s more?  
What about the “push button” “get food” dream?
Then the question remains:
What exactly is expert cooking intelligence?

“It’s the stuff dreams are made of.”

Magnetrons, Microprocessors and the Birth of Expert Cooking Intelligence

International Microwave Power Institute
Annual Symposium Orlando FL USA
June 23, 2016

Steven J. Drucker
Droaster Laboratories LLC
Atlanta GA USA

Steve.Drucker@InfinityOven.com

© Droaster Laboratories LLC 2016