WHAT'S COOKING?

Cooking - that event that occurs every day in every home. Our kitchens have the latest appliances, from microwave to double convection ovens. Cooking shows fill public TV with Jaques and Julia, and store racks are full of monthly magazines like Bon Appetit and Good Housekeeping. We even take our cooking love affair into our backyards – the barbeque. Cooking equipment needs energy to operate, and with energy consumption comes cost. Add to this, the cooling cost of mitigating summer kitchen heat, and outdoor cooking makes economic sense.

Arizonans know about cooking outdoors – men return to their primal selves, and women know it keeps the heat out of the kitchen, keeping the house cool and comfortable, and it keeps utiity bills down. Arizona is blessed with an abundance of sunshine - there is more energy in the sunlight that falls on a house than the total energy that house uses over a day.

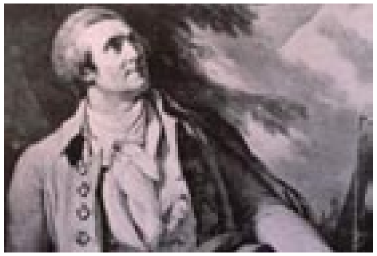
There it is - a resource untapped, underutilized, and available to anyone who wants it.

WHAT ABOUT COOKING?

We know about cooking with the sun

"it is so hot you can fry an egg on the sidewalk"

There is a great history of solar cooking from the Age of Inquiry to present day. 18th Century scientific investigation looked at natural phenomena and applied it to the technological and industrial activity of the time. With great fascination of the sun - its composition, its relationship to weather, and its impact upon plants, animals and people, experiments ranged from the power of magnifying lenses to the creation of highly polished concave mirrors for focusing the sun's rays to melt metals and set distant objects on fire, to creating steam to run a printing press to the development of ------- **cooking devices using the sun.**



HORACE deSAUSSURE

During the late 1700's, French-Swiss naturalist Horace deSaussure lay the foundation for not only solar cooking, but also for passive solar heating of buildings, and solar water heating, by use of solar collector boxes.

It is a known fact, and a fact that has been known for a long time, that a room, a carriage, or any other place, is hotter when the rays of the sun pass through glass

deSaussure created a series of experiments with nested glass boxes with air between, all sitting on a black base and aimed at the sun. The outer box had lowest temperatures (which was still higher than the outside air temperature) while the innermost box had the highest. With a little inventiveness, a lot of inquisitiveness, and experimenting he observed that

Fruits ..exposed to this heat were cooked and became juicy

The apparatus worked equally well in the plains and the mountains, even with their different temperatures..

Similar to todays modern cookers, deSaussure's unit allowed sunlight to pass through a glass cover and be captured as heat within an insulated box. The captured thermal energy heated the contents of the box - in this case, food!!

Other scientists and notables continued the inquiry. British astronomer Sir John Herschel experimented with the "hot box" to cook food in India. Samuel Pierpoint Langley, later to be head of the Smithsonian Institute, joyfully built hot boxes of his own. Frenchman Augustine Mouchot, combined the "hot box" with the focusing mirror and developed an oven that cooked food in a very short time. It was so effective that it was used by the French Foreign Legion. His "vertical oven" fit into a 20 by 20 inch box weighing less than 30 pounds and could bake a pound of bread in 45 minutes, and a stew in 3 hours.

W.A. Adams, developed a solar cooking unit very similar to today's popular contemporary ovens. A glass fronted box was mounted on a small tiltable platform, and using an eight sided mirror to focus the sun's energy to the center of the cooker, this design reached temperatures high enough to cook a four pound turkey within 4 hours.

The early 1900's saw scientists and backyard tinkerers alike develop design improvements on deSaussure's "hot box". That activity continues to present day and Arizona has a significant role in that development.

The First National Solar Cook-Out occurred Sept. 1981 at the Phoenix City Plaza.. Sponsored by the Arizona Solar Energy Association, it was the first event of its kind in the world. It showcased designs from the largest, which cooked 60 pounds of food at a time, to the smallest, used by backpackers in the Himalayas.

Arizona solar cooking continues in grand style today. The Kerr-Cole cooker, a simple, effective and low cost oven, is used all over the world, especially in resource poor countries. Tucson's Annual Solar Pot-luck, put on by Citizens for Solar, a non-profit organization of solar cooking enthusiasts is an event where cooking folks, and the curious alike, get together preparing and eating breads, meats, vegetables, lasagna, and even pizza. Cookers of all shapes and sizes are set up and through the day provide tasty food that is shared.

The Pot-luck show just how easy and effective solar cooking is in preparing delicious foods, and the public sees first hand just how this natural no-cost-energy cooking approach provides for a more comfortable kitchen environment and lowers home energy costs in the intense Az. summers.

SOLAR POT-LUCK

Today's solar cookers function much as the early predecessors, but with the advantage of experience and contemporary materials. The components are the same - an insulated container with a transparent top to allow sunlight to the interior. Sunlight impacts the interior surface, is transformed to heat energy, which is absorbed by the cooker interior and its contents. While a little heat escapes back through the glass, most is contained within the box and food is cooked.

Additional sunlight can be directed to the interior by use of reflectors. These serve a dual purpose in allowing the regulation of the sun's energy that travels to the box thereby giving some temperature control, and also in acting as a folddown cover to protect the glass during transport.

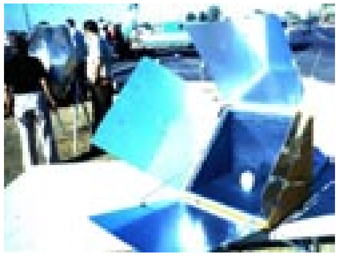
Solar cookers come in all sorts of sizes, shapes, and construction. There are commercial products and there are home-made ovens. The simplicity of a solar cooker reflects the simplicity of its use and designs fall into some basic categories

BOX COOKER

Box Cookers are simple, insulated boxes with a heat resistent transparent cover which can be a removable lid acting as the oven "door". The interior is black in color for fuller solar absorption. The box container can be made of virtually any material, from high tech polymers to simple plywood to extremely low cost and light cardboard construction.

It provides slow, even cooking of large amounts of food, with temperatures ranging between 140 - 225 degrees depending on construction. Addition of reflectors achieves the higher temperatures.

SLANT FACED COOKER



With the slanted face pointed directly at the sun, this type of cooker puts the collector glass in a more perpendicular orientation to the sun's rays while maintaining a level interior. These cookers are usually highly efficient and the addition of reflectors will significantly increase performance.

These cookers can be made to be portable with collapsable reflectors of aluminum or mirrored foil glued to a sturdy backing, folding onto the top of the cooker for easy transport.

MULTI-FACETED COOKER

A faceted conical shaped interior covered with many small mirrors, this cooker brings more reflected light directly upon food and cooking pots, reaching temperatures of 300 - 450 degrees, and operates the same as a conventional kitchen oven. The larger size (generally 4' diameter) is large enough to roast a turkey.

PANEL COOKER

Instead of a totally contained oven and cookware, this cooker, developed in France, has reflector panels, directing sunlight directly onto a dark colored cooking pot inside a plastic cooking bag or under a glass bowl. These cookers are easy to use, very portable folding into a small package, easy to assemble, and are extremely low cost so multiple panel cookers can be used.

CONCENTRATING COOKER

A curved, sometimes concave, reflective surface (aluminum,. foil, etc.) that focus' the sun's energy to a single focal point at which is placed a pot sitting on a separate stand. Temperatures exceeding 600 degrees have been attained. In order to be effective, this cooker requires more continuous attention in order to keep the focal point on the cooking utensil as the sun changes position across the sky . .

These cookers can be complicated to make, and because of the high heat generated at the focal point can be dangerous, causing burns and eye injuries if not used correctly.

The variety of cookers shows that there is abundant choice for the user – depending on situation, costs, and the desire for just plain fun.

The common question from people is

WHICH IS THE BEST COOKER?

Which gains this response from solar cooking enthusiasts.

"THE BEST SOLAR COOKER IS THE ONE THAT YOU USE!!!!!!!"

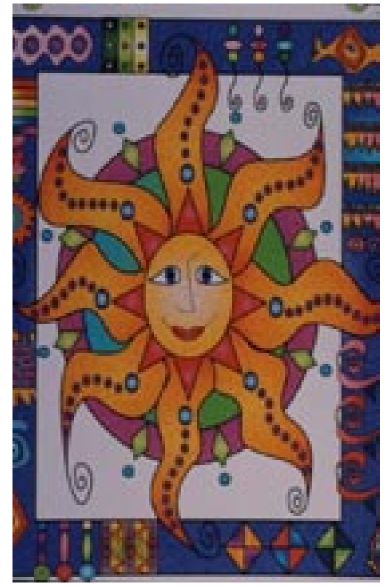
Today, solar cookers are growing in use, not only in technological, energy rich countries, but also in countries where there are depleted resources for cooking. Whether motivated by need or by choice, solar cooking is finding its way into the lives and lifestyles of peoples around the world. and cookers are used in Arizona backyards next to, and in place of, the American barbecue, and are even being designed as a permanent component of existing and new housing.

Arizona has an abundance of sun; a treasure of solar experience and knowledge, and an affinity for outdoor living. Solar cooking is a natural fit - not only for celebrating the summer but for year round use, and it can be a significant aspect of keeping summer cooling bills down. Solar cookers come in a variety of configurations and construction, are commercially available or can be self-constructed, but they all have a commonality –

They are effective!
They are fun to use!
They reduce energy demand!
They reduce costs!

and according to solar enthusiasts,

they are healthier!!



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