The EVOLUTION of COOKING and HEATING

By H. H. Manchester, A. B.

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Mixing dough and baking in the ashes, Egypt. From a tomb painting of the Fourth Dynasty, about 5,500 years ago.

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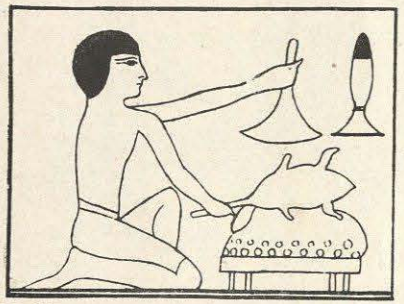


Broiling a goose, with a spit through the neck. Egypt, 5,500 years ago. In the left hand is a wisp of straw to brush off the soot and ashes. From a tomb painting.

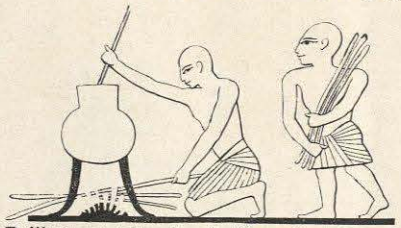
The everyday things of life often have the oldest and most interesting histories. Ranked by its length of ancestry, the kitchen would be far more aristocratic than the parlor, and few things have had a more striking evolution.

In the Glacial Age

Cooking and heating go back at least to the Glacial Age, probably fifty thousand years ago. In the caves of Altamira and La Madeleine, on the border of France and Spain, have been found the partially burned bones of the mammoth and European bison, while pictures of such extinct animals on the walls prove the presence and instrumentality of man.

The fire of that age was merely an open one. Meat was roasted on spits over the embers. Boiling was accomplished by filling a hollow in the rock with water, which was heated by throwing hot stones into it. Possibly they also used vessels scooped out of sandstone, a few of which have been preserved.

Types of Cooking Equipment in Ancient Egypt



Boiling vegetables in a kettle. Egypt, 3,500 years ago. From a tomb picture of the 18th Dynasty.

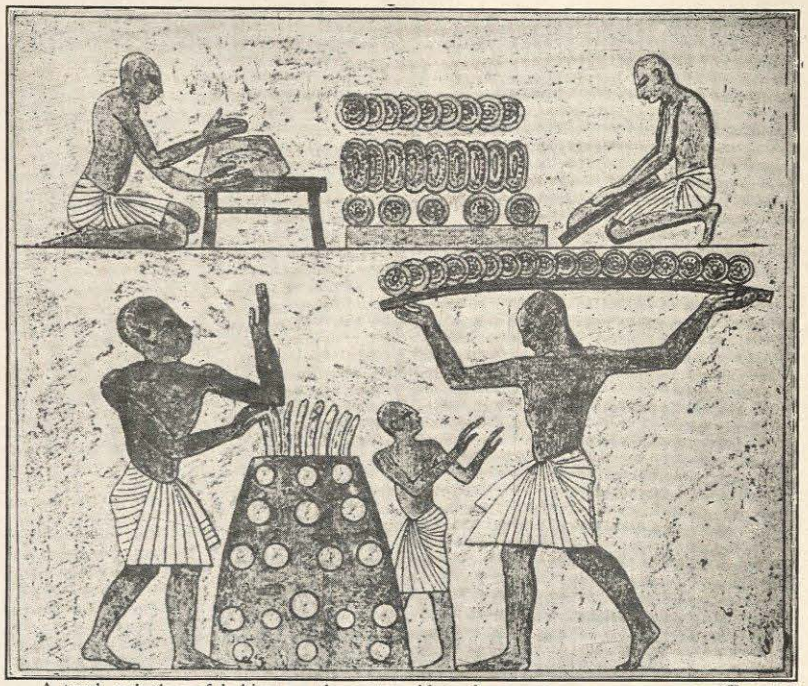
The first exact evidence in regard to equipment for cooking, dates from Egypt and the dawn of history about 6,000 years ago.

Among the wall paintings of the rock tombs, in which the ancient Egyptians portrayed almost every aspect of life along the Nile from 4000 B.C. to 1000 B.C., there are a number illustrating the preparation of meals.

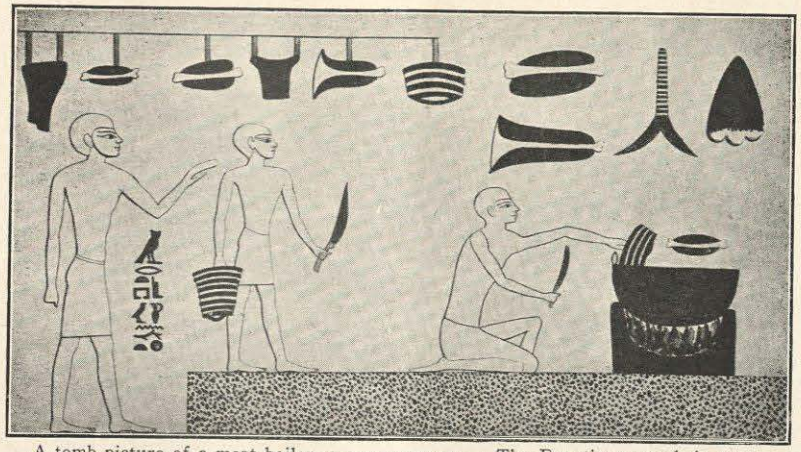
The earliest and most primitive of these are representations from the Fourth Dynasty, about 3500 B.C., of shepherds broiling on spits and baking cakes in the ashes.

Boiling in kettles is not represented in such early pictures, but as pottery goes back to prehistoric times, undoubtedly this method of cooking was also employed.

By the time of the Eighteenth Dynasty, about 1600 B.C., the



A tomb painting of baking on the outer sides of an oven, 3,500 years ago. Egypt. The flames appear above the top of the oven, while the round cakes are seen stuck to the outside.



A tomb picture of a meat boiler, 3,500 years ago. The Egyptians cut their meat at the joints, as may be seen from the pieces shown at the top of the illustration.

kitchen had become a department of great importance, as proved by large paintings showing the details of the royal bakery and kitchen of Rameses III. These portray boiling in pots, frying on a griddle, and baking on the outside of a cylindrical oven.

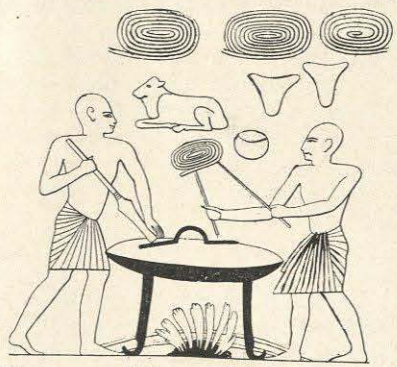
Thus even as early as ancient Egypt we find at least six different methods and types of equipment made use of in cooking.

The Egyptian bill of fare was varied, although lacking many things which we should now consider essential but were unknown until many centuries later.

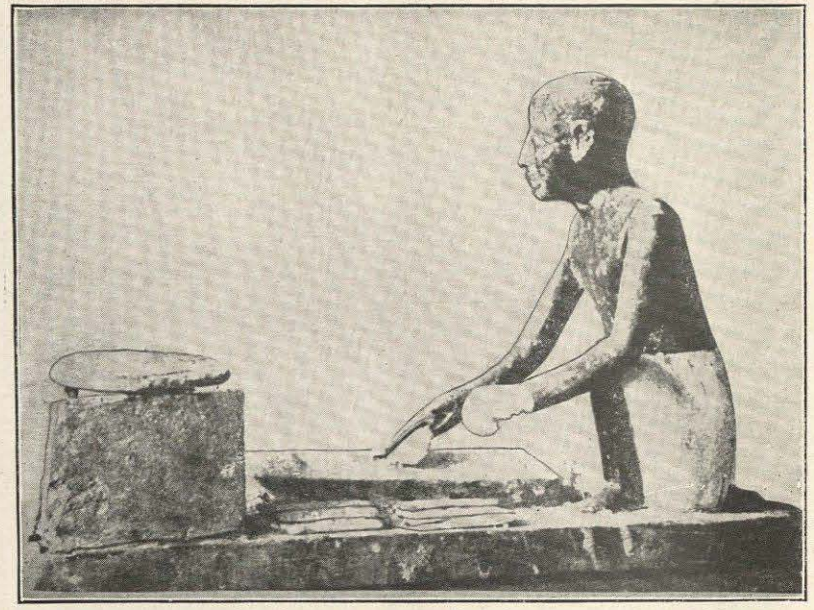
The favorite soup was made from lentils; the principal meats were beef and goose, but those of the ibex, gazelle and kid were occasionally served. Mutton was hardly eaten at all. Fish and birds were even then salted down.

The Egyptians were said to have adored cabbage, and made great use of onions, cucumbers, melons, figs and dates. A king's offerings in his tomb included fifteen kinds of meat, sixteen of bread and cake, ten of wine and beer and eleven of fruit.

The guests dined seated, while servants passed around the viands. They used knives for carving, but not at the table, and had no table forks or chop sticks.



Frying on griddle, 3,500 years ago. An operation in the royal kitchen. From a scene in the tomb of an Egyptian King.



Cooking on a stone griddle, Egypt, about 4,000 years ago. From a statuette buried in an Egyptian tomb.

They employed spoons for liquids, but handled solid food with their fingers.

One rather pretty custom was that of supplying each guest with flowers, partly for the sake of the perfume.

The climate of Egypt made the heating of the habitation of minor importance. Occasionally pots of charcoal were set in a room on a chilly night, or the family slept around the oven, which would radiate some heat even after the fire in it had died down.

In neither cooking nor heating was there any provision made to avoid the smoke. There were no chimneys, and, if the fire were inside the room, the smoke was left to find its way as best it could out of the door, window, or hole in the roof. The result was a great waste of fuel, which was already scarce in Egypt, and various diseases of the lungs and eyes.

Among the Hebrews

Among the Jews as well as among the Egyptians, lentils were a great dish, for Esau sold his birthright for a pottage of the red variety. The art of cooking must, however, have been progressing, for Rebekah prepared kid so that it would taste like venison and fooled blind Isaac in order to get his benediction on Jacob.

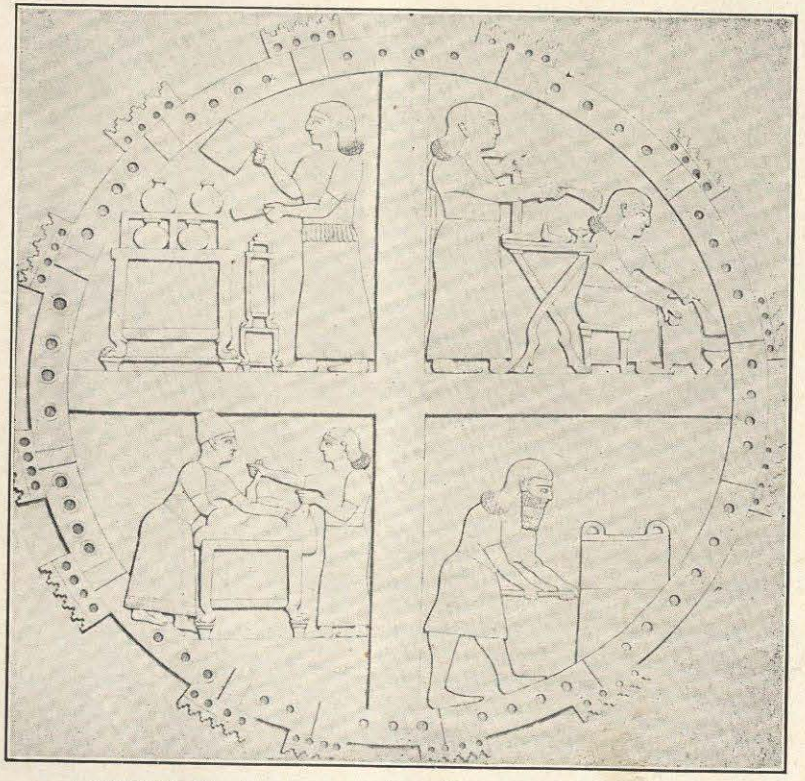
The Jews, while in the wilderness, longed for the flesh pots of Egypt. They remembered the fish which they "did eat in Egypt freely: the cucumbers, and the melons, and the leeks, and the onions, and the garlic."

The Jewish law considered not only the hog unclean, as is well known, but also the hare and such shell fish as the oyster.

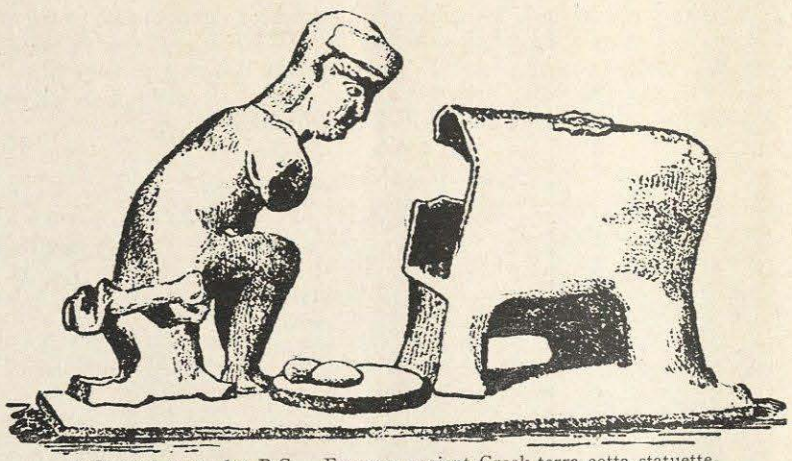
Assyrian Cooking and Heating

Of all the Babylonian and Assyrian bas-reliefs thus far discovered, there seem to be only two showing cooking, both of which are small details of a large picture of camp life about 750 B.C. One delineates a man cooking something over a small brazier, the other portrays a baker putting his dough into a little cylindrical oven.

Boiling in pots and broiling on spits over the fire, while not depicted, were methods also in use.



Cooking in Assyria, 2,700 years ago. From an Assyrian bas-relief. The operations apparently included the cooking over a small brazier, the preparation of meat, and baking in an oven.

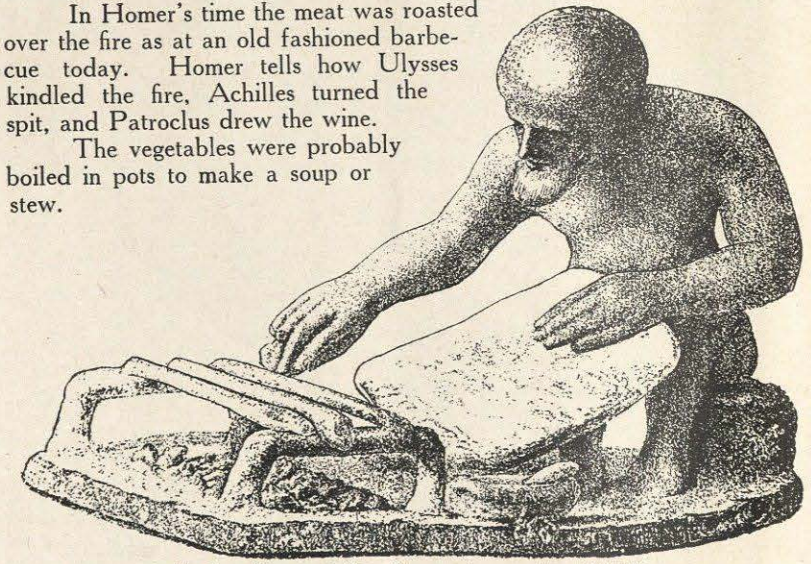


A Spartan oven, 600 B.C. From an ancient Greek terra cotta statuette.

In ancient times, a room in Mesopotamia was heated by means of a little brazier or pot filled with charcoal. Later, such a pot was buried even with the floor, the top covered and a rug spread over it. Under this rug the family would crawl for the night to get the benefit of the heat, in spite of the dangerous gases which unavoidably rose from the charcoal.

In Homer's time the meat was roasted over the fire as at an old fashioned barbecue today. Homer tells how Ulysses kindled the fire, Achilles turned the spit, and Patroclus drew the wine.

The vegetables were probably boiled in pots to make a soup or stew.



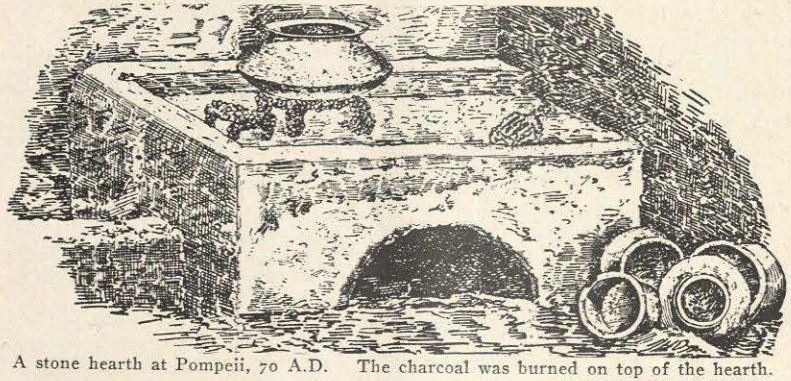
A Greek grill, 500 B.C. From a terra cotta statuette.

The black soup of early Sparta was notorious. The cook said to the Tyrant Dionysius that it needed the seasoning of fatigue and hunger. A native of Sybaris said of it, "No wonder you Spartans scorn death, for any sane man would rather die than live on such food."

Professional cooks had been developed before the time of Pericles. One of their triumphs was a whole pig roasted on one side, boiled on the other, and stuffed with birds, eggs, and pungently seasoned dressing. Nero of Corinth was said to prepare Conger eels into a dish fit for Zeus himself.

An indication of the early methods of heating in Greece is given in the Odyssey, book XIX, where Penelope's maids are described as throwing the embers out of the braziers upon the floor, and heaping fresh wood upon them.

In the classical period, charcoal was used for fuel, and gum, spices, or bitumen burned to add a pleasanter odor to the smoke.



A stone hearth at Pompeii, 70 A.D. The charcoal was burned on top of the hearth.

At Rome

The early Romans were abstemious, a consul sometimes dining on a single roasted turnip. But even before the end of the Republic, luxuries of every sort were imported at enormous expense from the East, which led Cato, the censor, to exclaim, "How can you save a city in which a fish sells for more than an ox!"

Julius Cæsar is said to have spent the revenues of several provinces on a single meal. Nero squandered from $240,000 to $400,000 on each of several banquets. Apricius expended $4,000,000 on dinners and then killed himself because he had only $400,000 left.

The dinner courses were as amazing as their cost suggests. Vitellius ate 1,000 oysters at a sitting. At a dinner given him by his brother, there were 2,000 different dishes, a detail of which included 7,000 fat birds. Domitian convoked the senate to discuss how a big turbot should be cooked. Heliogabalus served the brains of 600 ostriches at a meal, and considered camel's feet the greatest of delicacies.

The Romans imported the peacock from Samos, the turkey from Phrygia, cranes from Melos, the mullet and oysters from Tartery, and crabs from Chios. They brought asparagus and sweet cherries from Asia Minor. Among other vegetables were onions, truffles and mushrooms. The seasoning was sometimes more strong than appetizing, even nitrum and asafetida being used.

Banqueting customs were in great contrast to those at present. After being bathed and carefully barbered, the guests threw off their togas, put on soft dinner robes, removed their sandals so that their feet were bare, and reclined on couches while they ate.

The names of the dishes were called out by "nomenclatores." There were no forks, in lieu of which the guests used their fingers. The assemblage was often amused by acrobats and even gladiatorial contests.

The cooking was done over braziers, or on grills, which were often set upon stone hearths. One of these hearths found at Pompeii had a top arranged to hold live coals, and a space underneath which seems to have been used for the storage of fuel. Thus the stone hearth was practically an immovable brazier.

The kitchen had no chimney, and in even the great establishments the smoke had to filter out of whatever openings there were. In fact, the sycophants of the period, who chased from one house to another wherever they thought they stood the best chance of getting a meal, used to judge of the prospective feast by the amount of smoke pouring out of the roof.

Although not applied to the kitchen, chimneys had by this time been invented. The ruins are still standing of one which was erected in a bake shop in Pompeii, and Strabo also mentions that they were used in smelting.

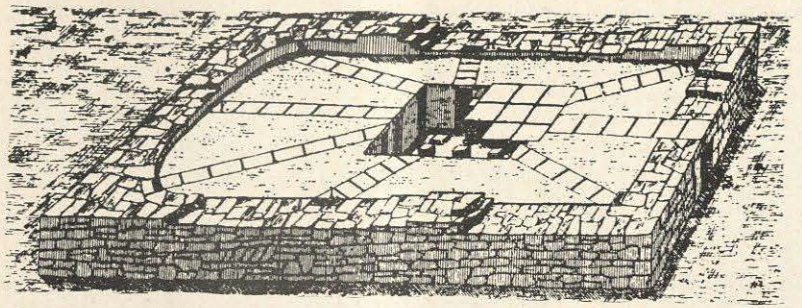
Roman Inventions for Heating

It was in the equipment for heating that the Romans made the most remarkable improvements.

As Seneca wrote, "Many inventions have come within my memory,—such as windows made of transparent plate, suspended baths, and pipes from hypocausts so inserted into the walls as to spread an equal warmth through the room, and heat what rooms are beneath as well as above."

The hypocaust was invented by Sergius Orata about 100 B.C. It consisted of a low basement chamber, at the entrance of which was burned the fuel. This warmed the room above, and

A brazier with a waterback, Pompeii, now in a museum at Naples.



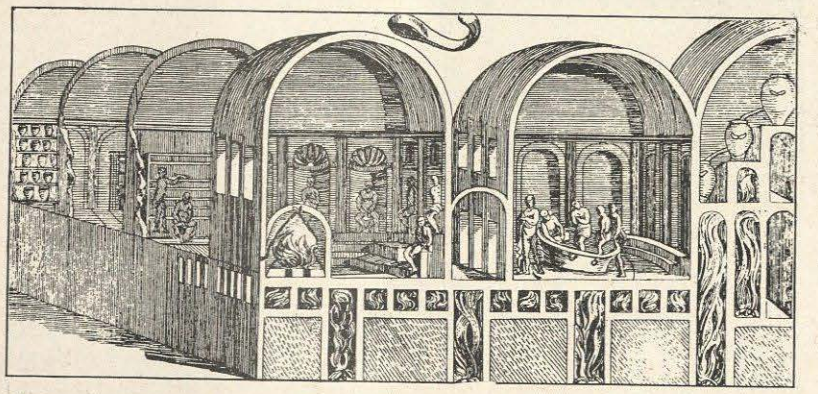
Remains of an ancient Roman bath, showing hypocaust and ground flues.

from this chamber flues were often led along the floors and upward inside of the walls to other rooms. It was adapted particularly to the baths which were developed so elaborately under the Empire.

In a bath, the cold water was run from the roof into a vessel or tank where it was heated through a long upright flue from the hypocaust and in certain rooms used at this temperature. To warm this water further, it was siphoned from the first tank into a second one, not so far above the hypocaust, where it was heated through another flue. To be made still hotter it was drawn from the second tank to a third one having a short flue running down to the fire. Thus the bath was constantly supplied with cold, tepid and scalding hot water.

Another method of heating the water was by sending it through "dracones," which were coils of thin brass pipes passing through large jars where they were subjected to the heat of the flames. The action was very much the same as in the instantaneous water heaters of today.

Relics from Pompeii prove that the braziers often had places for

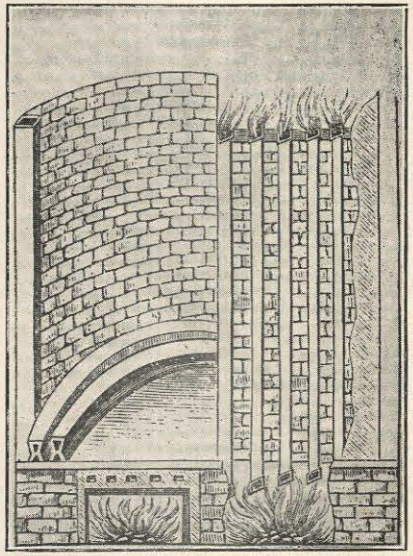


Antique painting, found in the Baths of Titus, showing the hypocaust under the baths and the method of heating the water in successive kettles.

water tanks at one end, somewhat analogous to the water backs of the modern ranges.

Although so much attention was paid to luxuries in the baths, the private dwellings of the Romans had few conveniences in regard to heating, even in the better villas in the colder provinces where artificial warmth would be most needed.

Pliny's villa had only one chamber that could be heated artificially, while the Emperor Julian wrote that in the palace which he occupied at Paris, he was almost fatally suffocated by gas and smoke from the fire brands which had been brought in to warm his chamber. His successor, the Emperor Jovian, actually died, as stated by Ammianus Marcellinus, through suffocation from the charcoal fire in his bedroom.



Plan from a Pompeian drawing, showing the arrangement of flues in the walls for heating.

Boiling and broiling at the entrance of a tavern, 1338 A.D. From a miniature in the Loutrell Psalter.

Cooking in the Middle Ages

After the overthrow of the Roman Empire, most of the equipment for cooking remained in use, but the baths were neglected by the barbarians, and even looked upon as sinful by the ascetics of the early church. In fact, the Dark Ages have been called "a thousand years without a bath." Although this is an exaggeration, it is true that the Roman methods of heating were forgotten, and rediscovered only in recent years.

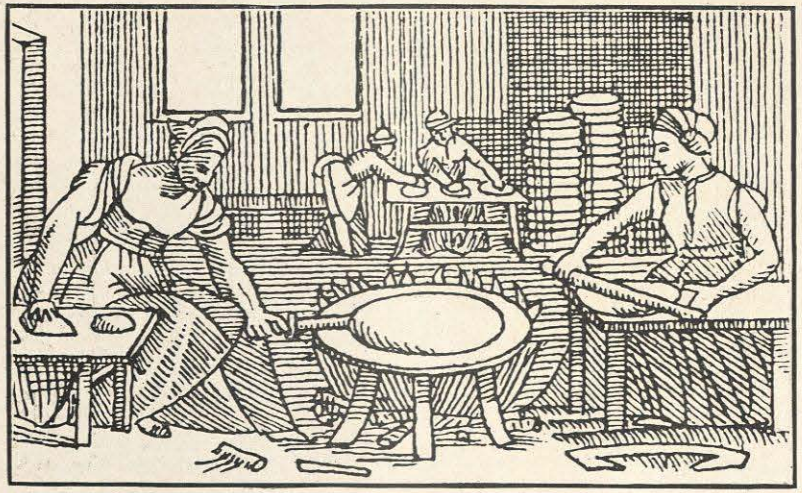
The miniature pictures and manuscripts of the Middle Ages indicate that the two most common methods of cooking employed during that period were broiling and boiling.

There were several devices employed for turning the spits. Some of these made use of a fan which was revolved by the rising smoke. In others a dog was kept at work in a revolving treadmill.

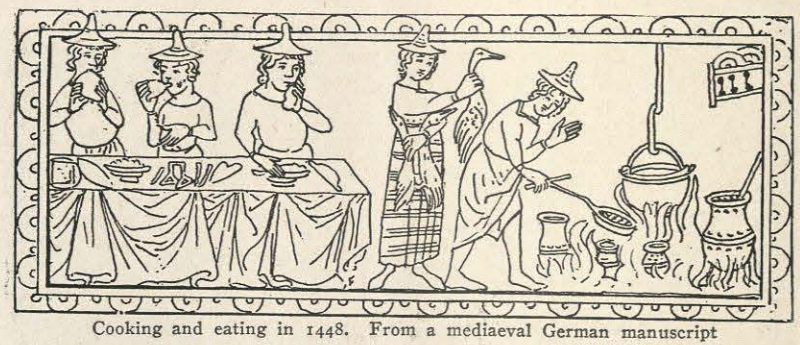
Cooking and sewing in 1100 A.D. From the Bayeux-tapestry, which pictures William of Normandy's conquest of England.

The bread, such as it was, was commonly made by the peasants in the ashes on the hot hearth. Sometimes, however, the home was supplied with a little outside oven much the shape of a beehive.

In some districts, especially in France, oven, or raised, bread had to be baked in the lord's oven, the rental of which was one of the perquisites of the lord. In other settlements there was a community oven which was used on certain days by all the village families.



Baking dough on a griddle. Norway, 1550. From a book by Olaus Magnus, the Bishop of Upsula.



Cooking and eating in 1448. From a mediaeval German manuscript

An Italian nobleman's kitchen, 1517. The picture emphasizes the variety of meats in the diet and the continued use of the Roman brazier.

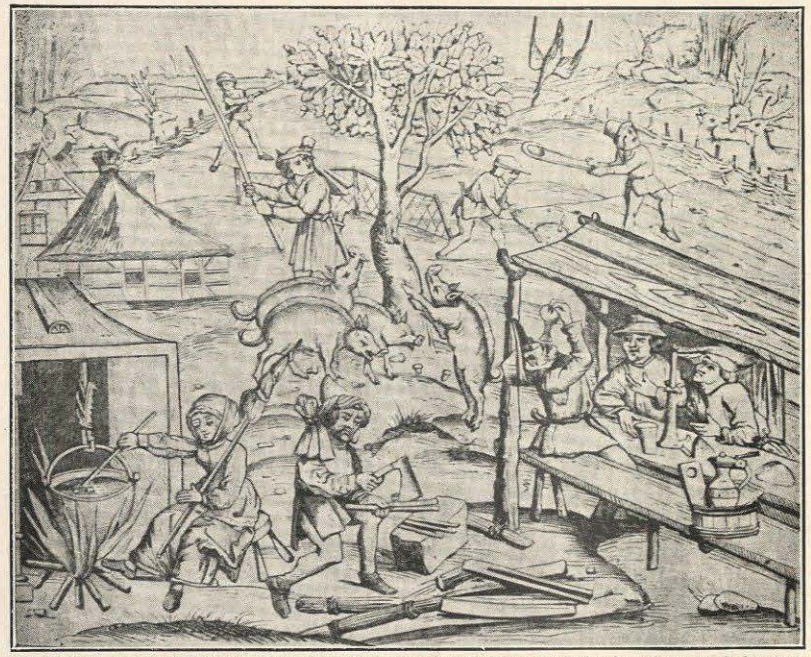
The detached kitchen of a mediaeval French monastery, with smoke louvers in the roof.

A device for turning the spit, Germany, 1600.

The prevailing characteristics of the food were the crude fare of the peasants and the rather barbaric abundance among the nobility.

A German housewife and two cooks, with the fire on a large stone in the center of the kitchen, 1516.

A kitchen interior. From a painting by Mostaert, about 1650. Holland.



A French peasant's home, 15th Century, showing boiling and the benches used for the table and seats.

A French peasant's home, showing pounding the grain in a mortar, the trough for dough and the outside oven, 15th Century.

Grinding, pounding meal, boiling and broiling, 1338 A.D. From an English manuscript miniature.

The principal Anglo-Saxon vegetable was kale wort, a kind of cabbage, which was helped out with beans, peas and onions.

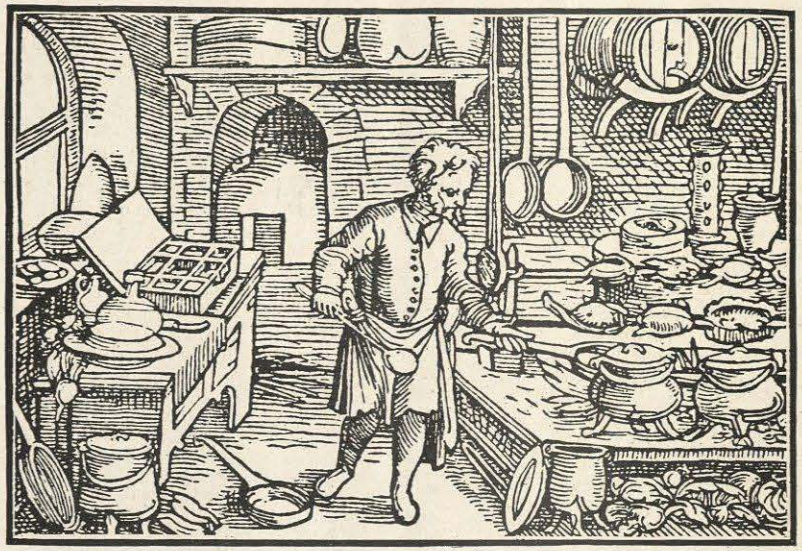
In France at the time of Charlemagne, cresses, lettuce, beets, parsnips, carrots, and radishes were known, but they did not find their way into England until much later. Sugar first came from the East during the Crusades.

The Normans were greater epicures than the Saxons. Several of their ceremonial dishes were famous. The peacock, for example, was skinned, then roasted, and the skin sewed on again. The comb was gilded, the tail feathers spread out, and the bird served to the accompaniment of music from the minstrels.

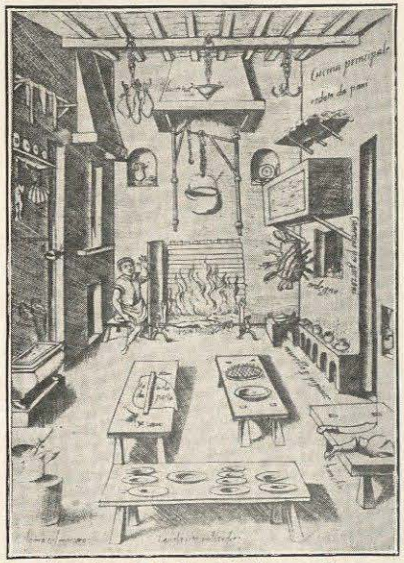
The royal appetite of that date would be considered quite extraordinary to-day. Queen Elizabeth used to drink a quart of strong ale for breakfast. A breakfast for an earl and countess included two loaves of bread, a quart of beer, another of wine, ten herrings, two cuts of salt fish, and a dish of sprats. Porpoises were served at the royal table as late as under Henry III.

Forks came into use in Italy about 1500, but were not introduced into England until 1611. They were long considered effeminate, and were roundly ridiculed by Beaumont and Fletcher and by Ben Johnson.

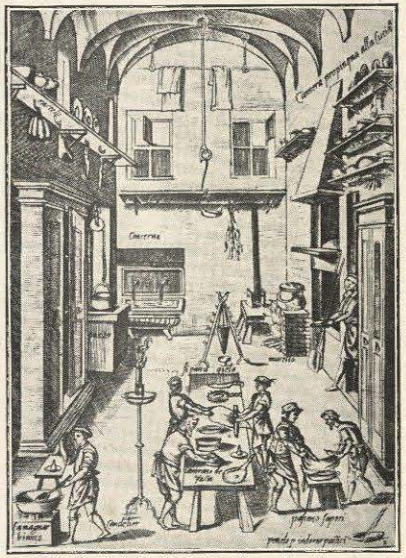
A fireplace and table set. From a manuscript of the 15th century.



A great German slab stove; also an oven of 1600. The oven seems to have been one of the Dutch type, but set directly in the fireplace.



A well-equipped Italian kitchen. From a cookbook by Scappi, about 1600. Italy.



A kitchen interior, by Scappi, about 1600. Note the cupboards at the side and the running water in the back of the room.

Preparing a feast. Italy, 1600.

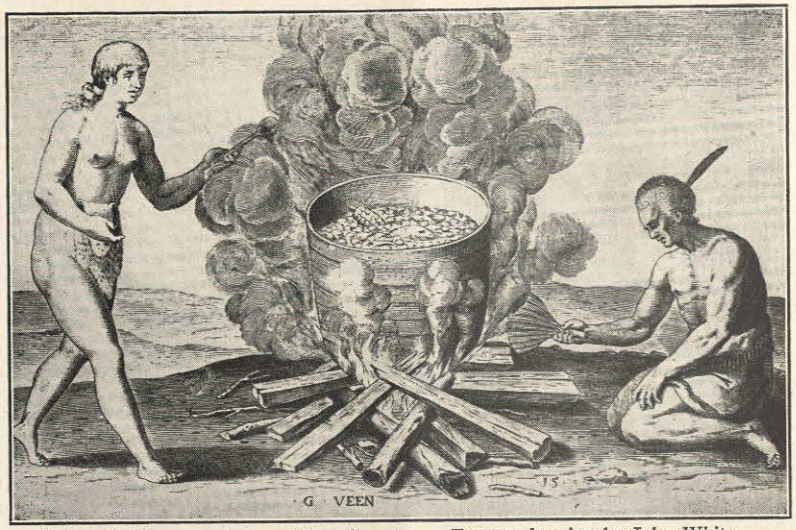
Boiling in a great kettle for a banquet. Italy, 1600.

Both of the pictures above are from Scappi's cookbook. In the first, the cooking is for an assemblage out-of-doors; in the second, for one indoors.

A large German kitchen of 1600.

A brick hearth of 1587. From a drawing by Jost Amman in a German cookbook. This cut and the one below it show kitchens in great houses, and as Amman made a specialty of industrial drawings, they probably are faithful representations of their subjects.

Jost Amman's drawing of a cook and his stove hearth, 1587. From a German cookbook of that date.



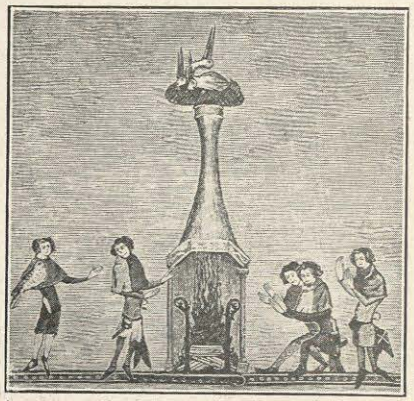
Indians boiling succotash. Virginia, 1590. From a drawing by John White.

At the time of the discovery of America, the Indians had only the crudest methods of cooking. Two pictures made by John White in 1590, show the apparatus employed by the Indians for broiling and boiling twenty-seven years before the settlement of Jamestown. Boiling was also done in the prehistoric style by throwing hot stones into hollows in the rocks which had been filled with water.

Indians broiling fish. Virginia, 1590. From a drawing by John White.

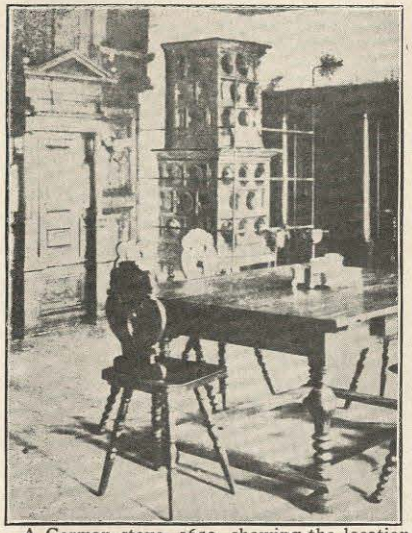
A bedroom scene, showing the fireplace of the 15th Century. From a manuscript miniature.

Heating During the Middle Ages



A manuscript miniature, showing the fire and chimney with a stork's nest on top. About 1340 A.D.

The principal advance in heating during the Middle Ages, came through the introduction of chimneys into private dwellings. For many centuries the fire had been merely piled up in the middle of the room or burned in a brazier. The first chimneys for private dwellings seem to have been introduced in France in the eighth century, but they were certainly very rare and did not become common for several hundred years. Some of the oldest relics of chimneys show them as a drawing-out and tapering of the whole roof of the kitchen, which was detached from the rest of the mansion.



A German stove, 1650, showing the location at the intersection of the walls.

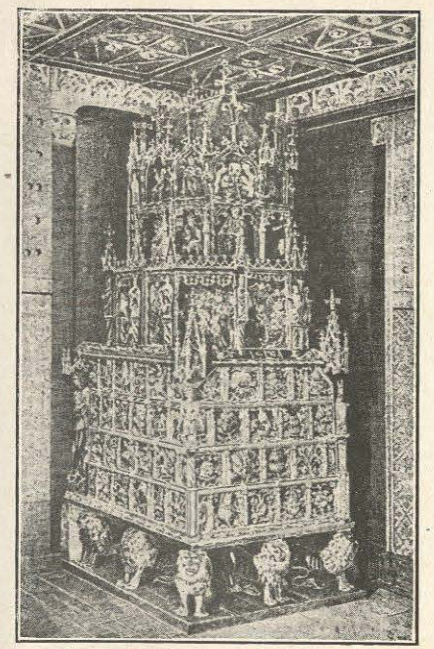
The earliest fireplaces were without a grate; and the flue, instead of leading into a chimney, simply narrowed to a small slit which was carried out of the side of the wall not far above the fireplace.

Several notices of chimneys are to be found in England in the twelfth century, and a description of the earthquake at Venice in 1347 A.D. mentions that it hurled down many chimneys. But in Rome in 1368 the Lord of Padua found no chimney at the palatial inn where he sojourned, and bringing workmen from Padua, had one constructed and decorated with his arms.

In Poland and adjacent countries during the early Modern period the heating of the house during the long winter months was done by a kiln which was built into the room but fired from the outside. The family slept not only around the sides but on top of the kiln.

The fuel in Europe had hitherto been almost entirely wood or charcoal, although coal had already been burned in China. The Saxons knew of coal but rarely used it. In 1239 however, a charter of Henry III permitted coal to be dug at Newcastle, and although seriously objected to on account of its fumes, coal gradually came into use to some extent, even in the open fireplaces of the period.

Although the fireplace is still more or less imitated for its decorative effect, it was far from a thing of comfort. Placed at one end of the hall, the draft was such that a person standing in front of the fireplace would al-



A Gothic heating stove of 1504. Such stoves, sometimes of tile and sometimes of iron, reached from the floor to the ceiling.

A dishwasher of an Anglo-Norman castle in the middle ages.

most freeze on one side while he was scorching on the other. Sudden drafts down the chimney often drove the smoke through the room and deposited soot over everything. Even in the great houses, only the main hall, or at most two or three rooms were heated.

It is hard to imagine that an age with so few factories could be deluged with smoke, but Evelyn says that the lungs of the Duchess of Orleans were permanently injured by smoke, and that musical friends of his who came to London actually lost, on account of it, three whole notes in the range of their voices.

One of the first steps from the fireplace toward the present day stove was to connect a tile oven with the chimney. Such an oven seems to have been invented in Switzerland in the ninth century. It was introduced into north Germany, and later carried to America by the Dutch. In one form it had openings into it from the fireplace and was also heated by hot coals being placed in it and afterwards withdrawn.

Another device was the square German box stove which was built against the chimney and opened into it. It was often built at the intersection of the inside walls so as to heat several rooms at once. Box stoves were later made of iron, and it is said that plates were cast for the purpose as early as 1509 in Ilsenberg. Cooking hearths with metal plates were made by Cardano in 1550.

A cook and her tin oven. From a painting by Jan Mostaert, about 1660. Holland.

Early Modern Improvements

At the beginning of the seventeenth century investigators began to realize that the fireplace sent most of its fuel and heat up the chimney, and various attempts were made to remedy this defect.

An 18th Century kitchen. Note the fireplace and at its right the round Dutch brick oven, opening into the fireplace at the side.

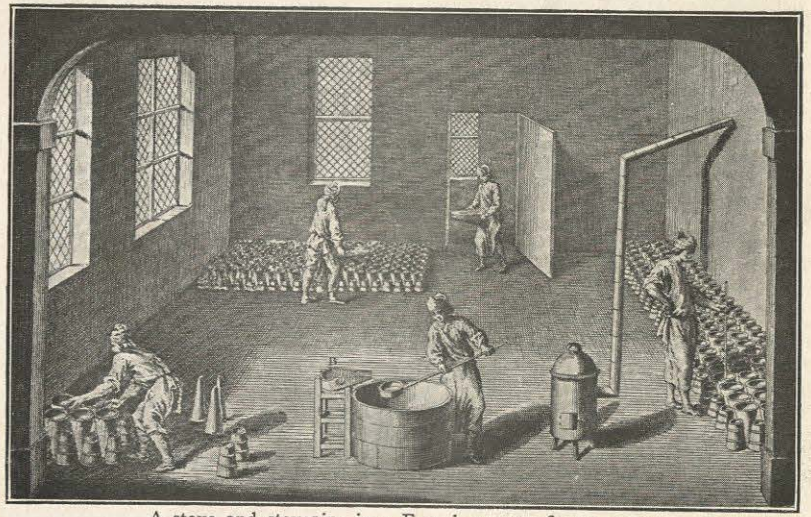
A fireplace in the Louvre in 1624 was built with air passages at the sides. Cardinal Polignac in 1723 put flues both at the sides and

Making oatcakes in Scotland, about 1800. The oat batter was cooked on the hearth, and the cakes first cooled on a cloth and then hung over a line to dry.

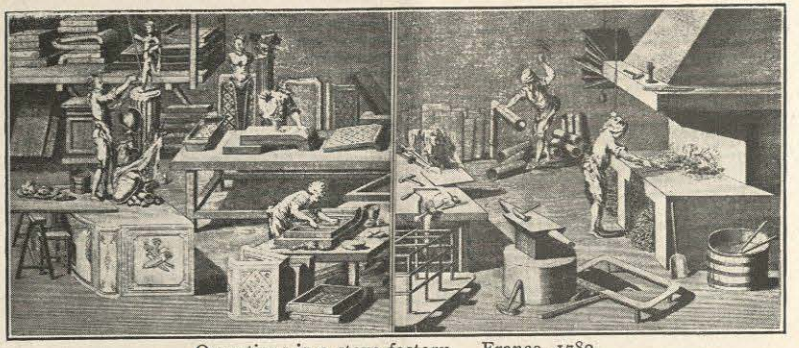
The Franklin stove, 1744. The smoke and hot air passed through a flue back of the stove down to the floor and under the floor to the chimney. It could be placed farther to the center of the room than here represented.

back, but his idea was cried down by people who objected to breathing "air that had passed through red hot pipes."

Metal jamb stoves, which were built through the chimney so as



A stove and stovepipe in a French sugar refinery, 1760.



Operations in a stove factory. France, 1780.

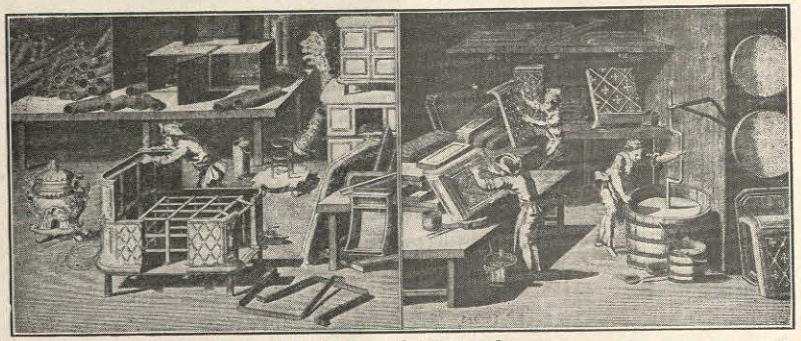
to warm the room opposite the fireplace, were made in the Colonies as early as 1730 to 1740 by Christopher Sower, of Germantown, Pennsylvania.

At this period the churches were heated only by foot warmers, which were small covered sheet iron pans about six inches square, filled with live coals.

In 1744 Benjamin Franklin constructed what he called the Pennsylvania fireplace. In this a box stove was set to a greater or less distance toward the center of the room. The smoke passed through a flue down the back of the stove and through another flue in the floor to the chimney.

The great advantage of this arrangement was that it gave forth heat from all sides at once. It needed little more than the invention of sheet iron stovepipe, about 1750, which could be run up through the room, to make it correspond rather closely to a modern sheet iron box stove.

Hot air heating, which had been used in a few isolated places during the Middle Ages, was in 1750, applied anew in St. Petersburg, where it was seen by Frederick the Great and a few years later adopted



In the same factory, 1780.

Philo Penfield Stewart

by him at Potsdam. Another appliance of Colonial days was the tin oven. This was a box shaped affair open at one side, which was set close to the fireplace so that baking could be done in it from the heat of the fireplace.

Troy, New York, seems to have become identified with the stove business in 1786, when box stove castings were ordered made in Philadelphia and shipped to Troy to be put together.

The famous American tory, Benjamin Rumford, the discoverer of latent heat, suggested in 1796 the warming of rooms by means of the chimney out of which notion the idea of the radiator in part developed.

Anthracite coal, which had long been considered mere stone, seems to have been first burned successfully, with the aid of a grate, by Joseph Smith in 1812.

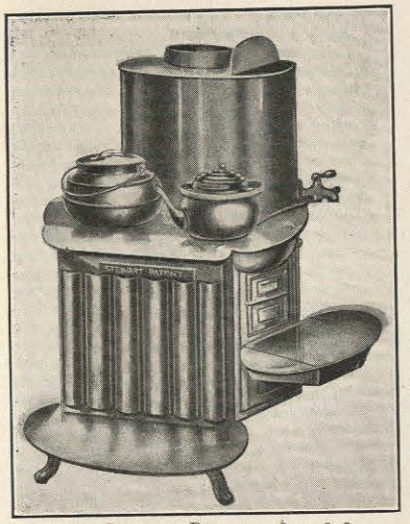
In 1819, Conant tried to make an out-and-out cook stove, but the oven was above the fire and heated unevenly.

The Father of the Modern Cook Stove

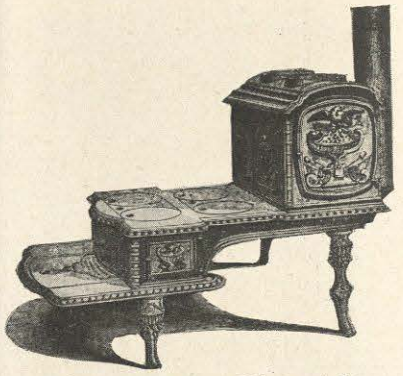
Philo Penfield Stewart, whose name is identified with the development of the modern stove, was born in 1789. He early showed a tendency toward mechanics, but dropped all to become a missionary among the Choctaw Indians in Mississippi.

After his return in 1832, he fashioned a sheet iron cooking stove which he called the Oberlin. His first idea for the Stewart "summer and winter cooking stove" was developed in 1836. This had the fire box hung in the oven, the flame passing down the front, along the bottom, and up the back so as to distribute the heat equally.

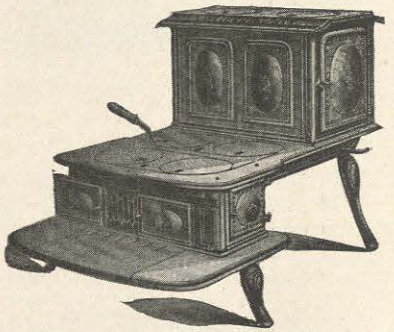
A Stewart range that didn't miss a day in 45 years. Similar to the design of 1832.



Old-time Stewart Range. 1832-1848.



The "Union," Civil War period.



The "Continental," with the new elevated oven, Civil War period.

Old-fashioned heating stove, about 1830.

When a barrel was used for a hot water tank.

Early Stewart stoves and ranges, in their time famous throughout the whole country

A Trip Through the Factory

Few people realize how much thought, knowledge, care and time are necessary for the design and manufacture of a stove such as the present Stewart Range.

There are from 125 to 150 different castings in a range, and, as each range is made in different sizes with or without reservoir, and the firebox on either right or left hand side, it usually makes a total of from twelve to sixteen different ranges to be considered.

A present-day Magnet Stewart, with Reservoir.

From the drawings, which have to be made with great care so that as many parts as possible will be interchangeable, the pattern makers construct a complete stove of wood. From these patterns, a few trial iron stoves are made and tested for baking and economy of fuel.

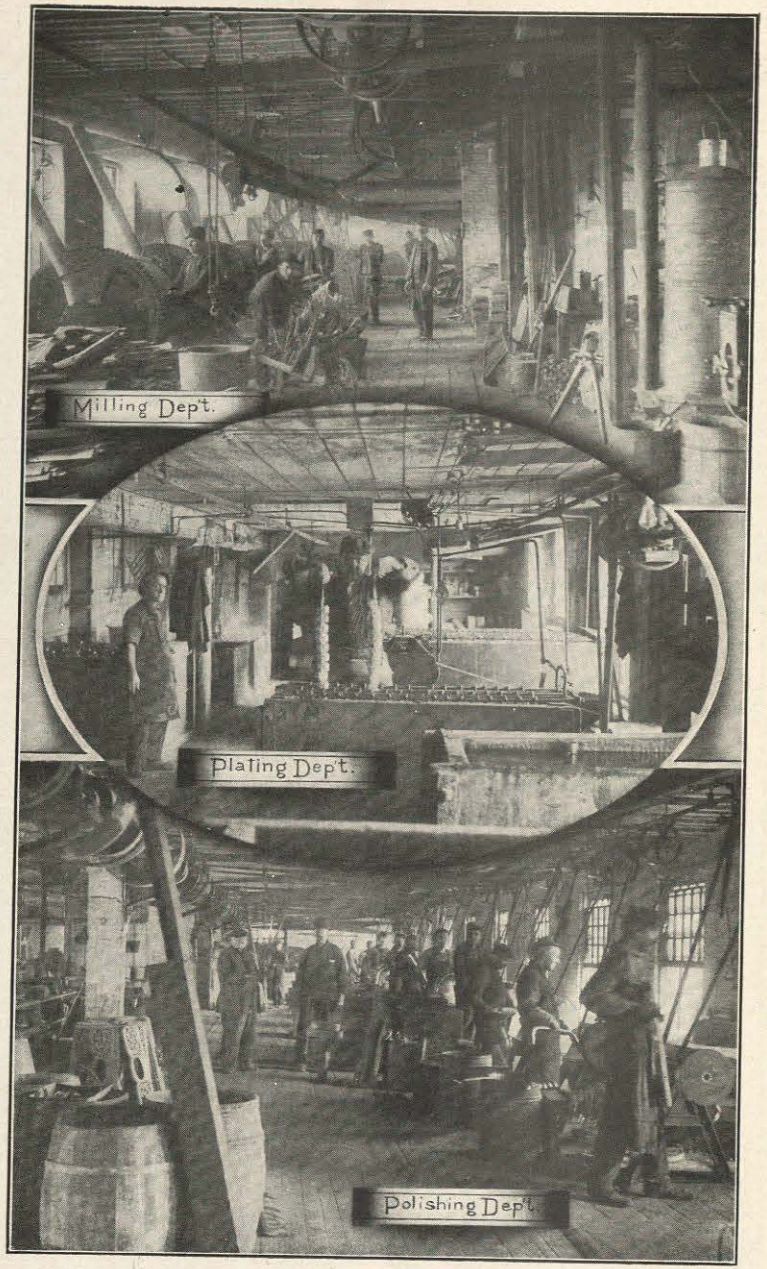
From the first drawings to this point, usually takes from six to eight months, and involves so much expense that many stove manufacturers merely buy duplicate patterns.

To produce castings that

are tough, smooth, durable and free from imperfections usually found in stove plate, it is necessary to know just the percentage of silicon, sulphur and manganese contained in the different brands of pig iron. Therefore, each car of iron is chemically analyzed before being used, and the "mixture" is made up each day according to the analysis.

The molders take the molten iron for casting from the cupola, in

In the Mounting Department



ladles of about 40 pounds capacity, and carry it to their floors with the help of an overhead trolley. They sometimes rush it along on a dead run, with as much contempt for danger as if it were water.

In the mill room, the castings are revolved in large cylindrical drums, together with small chilled iron stars, the constant rubbing of which cleans the castings from the gray sand which has in part fused with the hot iron.

The parts to be nickel plated are polished with wheels of leather, the circumference of which has been painted with glue and then rolled in ground emery.

Before nickel plating, all grease or oil is removed by electro-cleaning, which consists of immersing the castings in a strong solution of hot potash and passing an electric current through it.

Each stove must be mounted with the greatest care, for, if the joints are not absolutely tight, perfect operation is impossible. The stoves are then blacked, crated, and sent to the warehouse.

The making of furnaces is an important part of the business. The designs are similarly complicated; and the pattern making, molding, and mounting all require the same careful planning, extensive knowledge, long experience, and finished workmanship.

Recent Changes

In the past few years oil stoves for cooking have become very popular, especially in the summer, because they are so cool and convenient. The Standard Oil Company have marketed these stoves with great success all over the world.

Electricity has also been applied to cooking and heating, but the cost of operating is so high that its large use is limited to districts where electric power is comparatively cheap.

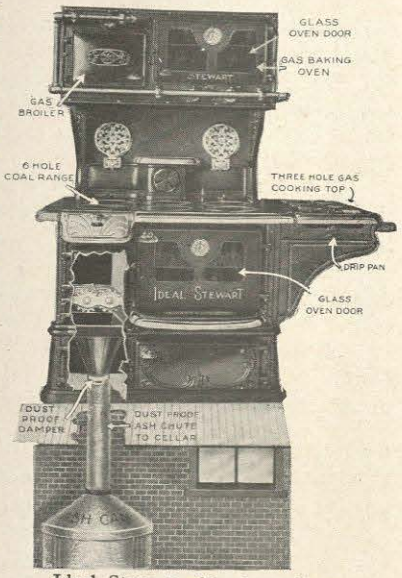
A modern furnace.

A Revolution in the Life of the Household

The ranges, stoves and furnaces produced by the Fuller & Warren Co. today, have many great improvements over the cooking and heating apparatus of the past. Our grandmothers did not enjoy the conveniences of an oven that always gave perfect results, or a thermometer to indicate its temperature. They did not have a glass oven door, a top

that required no blacking, a dust proof shaking grate, a chute for the ashes direct to the can in the basement, an almost unlimited supply of running hot water, and many other features. Our grandmothers never had the pleasure of using a combination coal and gas range, which insures a comfortable kitchen winter and summer, gives double cooking capacity, and lightens the work in the kitchen in many ways.

The heating stove is gradually giving away to the central heating plant, which is located in the cellar and heats the whole house. For the home, there is no better nor healthier system than the warm air furnace, which furnishes a constant supply of fresh, pure, warm, outside air, to every room in the house.



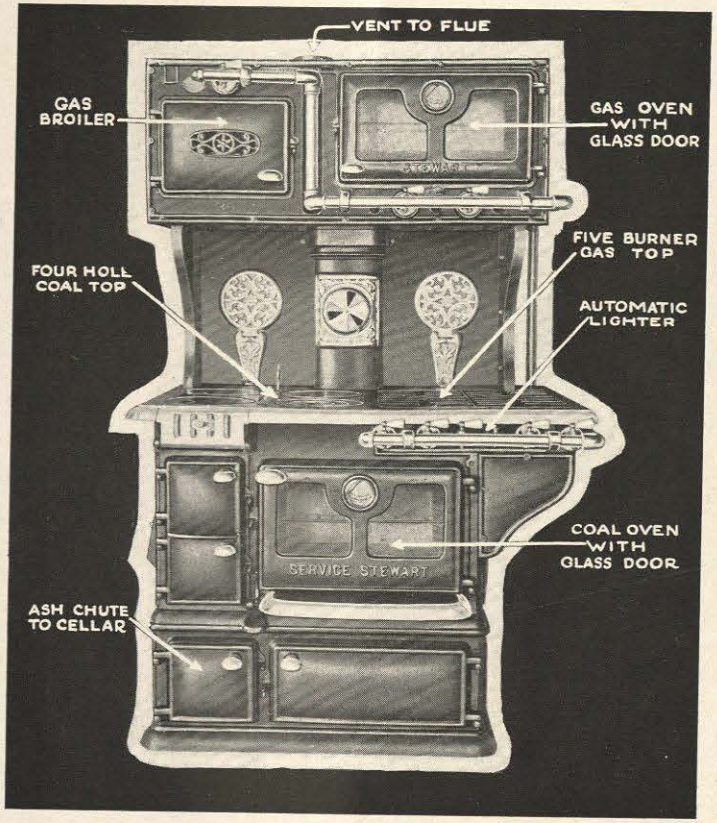
Ideal Stewart with elevated gas attachment and ash chute.

Eighty Years of Reliability

For over three-quarters of a century, Stewart cooking and heating apparatus has been manufactured, and carefully developed; and experience has proven that they are superior in efficiency, economy, convenience and durability.

In conclusion, the slowness of the evolution of cooking and heating apparatus has been due to the fact that, far from being simple mechanical devices, they are in reality highly complicated. Because of this, perfection in their manufacture requires not only the genius for their invention, like that of P. P. Stewart, but great practical knowledge and many years experience. For this reason, it pays to deal with a house that has a history and rely upon ranges, stoves and furnaces that have a record.

Ideal Stewart with end gas oven and high closet. Glass oven doors.



Service Stewart—Combination Coal and Gas Range. A very compact stove with double the ordinary cooking capacity, and fitted with many conveniences, and labor saving devices which were unknown a few years ago.