cooked with gooseberries in a digester, the fish being good and firm, and the bones so soft as not to be felt in eating ; and he particularly recommends, as an excellent dish cooked in this manner, cod fish and green peas.

The most important of Papin’s experiments are those on the extraction of gelatine from bones, as now done on a large scale in France and in this country, as also the manufacture of essence of meat, soups, &., especially suitable for long sea voyages.

“ I took,” says he, “ beef bones that had never been boiled, but kept dry a long time, and of the hardest part of the leg; these being put into a little glass pot with water, I included in the engine, together with another little glass pot full with bones and water too, but in this the bones were ribs and had been boiled already. Havingprest the fire till the drop of water would dry away in three seconds, and ten pressures, I took off the fire ; and the vessels being cooled, I found very good jelly in both my pots ; but that which had been made out of ribs had a kind of a reddish colour, which I believe might proceed from the medullary part, the other jelly was without colour like hartshorn jelly ; and I may say, that having seasoned it with sugar and juice of lemon, I did eat it with as much pleasure, and found it as stomachical, as if it had been jelly of hartshorn. Mutton bones are better than beef bones ; and he infers (1.) that one pound of beef bones afford about two lbs. of jelly ; (2.) that it is the cement (gelatine) that unites the parts of the bones, which is dis solved in the water to make it a jelly, since after that, the bones remain brittler ; (3.) that few glutinous parts are

sufficient to congeal much water, for I found that when the jelly was dried, *I* had very little glue[-ten?] remaining; (4.) I used it to glue a broken glass, which did since that time hold very well, and can be washed as well as if it had never been broken ; (5.) it is heavier than water, and sinks to the bottom ; (6.) hartshorn produces five times its weight of jelly.

“ From all these experiments, I think it very likely, that if people would be persuaded to lay by bones, gristles, tendons, feet, and other parts of animals that are solid enough to be kept without salt, whereof people throw away more than would be necessary to supply all the ships that England hath at sea, the ships might always be furnished with better and cheaper victuals than they used to have. And I may say, that such victuals would take up less room too, because they have a great deal more nourishment in them in proportion to their weight. They would also be more wholesome than salt meat. Vege tahles, such as dried peas, may also be cooked by the steam of salt water without becoming salt.”

We have entered thus fully upon the work of Doctor Denys Papin, and the properties of his digester for cooking, and extracting jellies by high-pressure steam, because it contains nearly all that is at present practised in the preparation of food by steam.

If to what has been already stated, we add, that if the steam of salt water be collected in a vessel kept cold on the outside, the condensed water will not be impregnated with salt, and may be used as food, the importance of steam in the economical and menial capacity of cook, will be sufficiently apparent. The supply of water to the crew of a steam vessel may be obtained in this manner, and an apparatus for thus procuring fresh water from the condensation of steam from salt water, has been used with advantage in ordinary ships.

Fig. 29 contains the steam-cooking apparatus used in modern kitchens ; *a a* is a portion of the kitchen fireplace In one of the divisions of it, *b,* is placed a steam boiler, furnished with the usual apparatus of feeding pipes, gauge cocks, &c. From this boiler a steam pipe, *c c,* is led along the back of the cooking table *d d,* and at certain

intervals, branch pipes, furnished each with a stopcock, project across the table at right angles to the main pipe.

The extremities of these branch pipes are conical, and made accurately to fit into conical sockets inserted into the cooking pans, one of which, *e*, is seen in its place on the table. These pans have each a double bottom, the lower one close, the upper one perforated ; between the bottoms the socket before mentioned, through which the steam enters, is inserted. The manner of using this apparatus is simple. The article to be cooked is laid in its place on the perforated bottom of the pan, the lid is applied, and the pan is joined to one or other of the branch pipes, by its socket receiving the conical end of the pipe ; the stopcock is now turned, and the matter in the pan is subjected to the action of the steam. Each pan has a crane in front, to allow of the condensed steam being drawn off.

The remaining part of the apparatus is the hot closet, *ff.* This consists of a steam-tight iron box, containing shelves, inserted in another iron box of dimensions so much greater as to allow of a considerable vacuity being between them ; into this vacuity the steam from the boiler is permitted to flow, and give out its heat to the articles placed in the closet to receive it.

Fig. 30 contains a steam-apparatus for cooking the