The boiler on the side of the fire not only serves to keep up a supply of hot water, but is likewise a defence to the cook in handling the pots and kettles from the side. Although the chimney, while wood was used in it as fuel, often failed to carry off the smoke, there has been no inconvenience arising from that cause since the plan above described was resorted to. Contrary to expectation, the chimney draws well at all times, without closing the door. In the association of the permanent boiler with the grate, it is not pretended that there is any thing new. In Dr. Hare's kitchen, water is supplied by a cock terminating a hydrant pipe; but the contrivance called the ball cock would be preferable; and it would be still more advantageous to have a cylindrical water-tight vessel capable of bearing the pressure of the water from the water works, agreeably to the plan pursued by Messrs. Morris, Tasker and Morris. By a boiler of that kind a constant supply of hot water is had without the trouble of replenishing the containing vessel.

It is important that the back grate should be very stout; it should form a large mass of metal, for its own protection in the first place; and in the second, in order that it may, by the conducting process, transfer heat from the fire to the plate resting upon it at the front edge. By these means it proves a reservoir of caloric, and serves to detain and render it more useful. The weight of the grate employed is eighty-four pounds.

FOR THE JOURNAL OF THE FRANKLIN INSTITUTE.

Novel Mode of Cooking Tough Meat, so as to render it Tender.

It was stated to Dr. Hare, by Mr. Jacob Perkins, now of London, that an old fowl, or a tough piece of meat, might be made tender by exposing it to the temperature of boiling water for a considerable length of time, the meat being placed in a vessel into which the water did not enter. The experiment was tried by Dr. Hare on a tough piece of beef; the apparatus used by him consisted of two vessels, one placed within the other, the space between them being filled with water, and the beef being closely covered in the inner one. The water was kept boiling for nearly twelve hours, and the results verified the statement of Mr. Perkins; the meat was rendered tender, and, with the aid of proper condiments, an excellent bouillie was obtained. Steam, of course, might be substituted for the boiling water, as the requisite degree of heat would be obtained by causing it to pass round the vessel containing the meat.

FOR THE JOURNAL OF THE FRANKLIN INSTITUTE.

Apparatus intended to show that if heat be motion, the capacity of Mercury should be greater than that of Water. By R. HARE, M. D., Prof. of Chemistry, University of Pennsylvania.

Sir Humphry Davy had suggested that heat might be ascribed to a gyratory or vibratory motion in the particles of ponderable matter. I have urged that if heat were motion, the laws of its communication should be analogous to those which operate between moving masses, and that as in the latter case the heavier body would have most influence in communicating motion, so in the former the heavier body should be more efficacious in communicating heat. Yet the facts were totally opposite to this community of result. Mercury, nearly 13.6 times heavier, bulk for bulk, than wa-

ter, and of course in communicating motion as many times more potent, had, in communicating heat, an effect only the half of that producible by a like bulk of water. A similar incongruity existed in every instance where the heating influence of a metal could be compared to that of water.

Professor Olmsted, of Yale College, alleged the law of motion to which I appealed, only to avail in case of motion in right lines: that it could not be applicable in the case of gyratory or rotary momentum. To verify the truth of my postulate, by ocular proof before my pupils, the apparatus represented below was contrived.

Both the globes, represented in the engraving, are of wood, but one of them, *W*, is loaded with a zone of lead. Either of the globes may be made to revolve upon its axis with great rapidity, by applying a string as in spinning a humming top. When one of the globes is set in motion, it is not to be in contact with the other, but by means of the slides at *B, B*, governed by a screw *A*, complete contact may be produced between them without disturbing that to which motion has been communicated. The momentum previously induced in one is thus divided between both, and the difference of its duration, accordingly as the heavier or lighter globe is the mean of communicating it to the other, is strikingly in favour of the heavier globe. I will not add *Q. E. D.*, because I should have supposed that the issue would have been sufficiently self-evident to every person having any knowledge of the subject, either in practice or in theory, yet as I was contradicted, flatly, by a respectable professor, and one for whom, personally, I have no small regard, I thought it best to prepare for my medical pupils, who are not supposed to be generally acquainted with mechanics, an ocular proof of the position on which my reasoning had been founded. The experiment has always excited much interest, and lessened the tedium of a theoretic discussion, in general abstruse, and unsusceptible of pleasing illustrations.