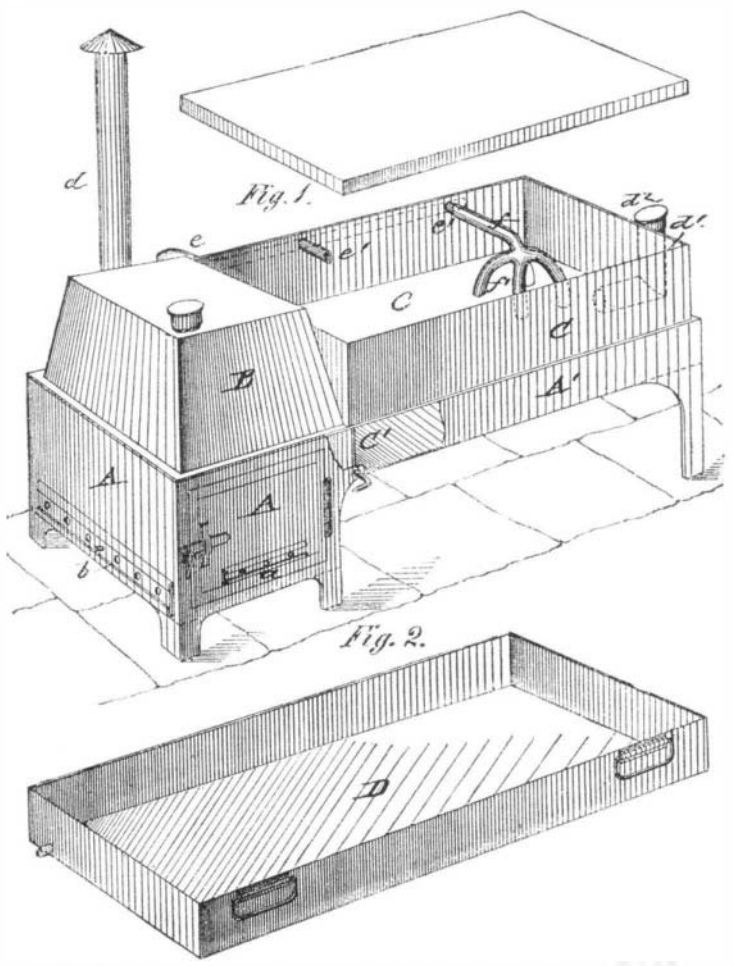
A NEW FOOD STEAMER.

Mr. Thomas B. H. Andrews, of Mansfield, Ohio, has patented through the Scientific American Patent Agency, November 28, 1876, an improved apparatus for-steaming food of all kinds, boiling sugar, canning fruit, and for other purposes, which we illustrate herewith.

A represents the furnace, and B the steam chest, which is placed upon the same, and supplied with water for generating steam from a reservoir. The food-steaming box, C, is supported on an extension chamber, A', of the furnace. which may be made in one piece therewith, of cast or sheet iron, and separated therefrom by a hinged damper, C', so that the gases of combustion may be drawn through the same, or not. The furnace has two additional dampers—namely, a front damper, *a*, and a side damper, *b*—the hinged damper, C', and side damper, *b*, being closed when the apparatus is used, as shown in Fig. 1, for the purpose of steaming food. The smoke, etc., is then drawn through a pipe, *d*, at the rear of the furnace, and transferred to a short elbow, d^1, commonly closed by a gap, d^2. When the apparatus is used for boiling sugar or other purposes, the hinged damper is opened to draw the fire through the entire extension chamber for the heating of the evaporating pan, D, placed on the furnace.

The steam chest, B, is connected by a steam pipe, *e*, and branch pipes, *e'*, with the food box, detachable pipes, *f*, with branching arms, *f'*, that open near the bottom of the food box, being applied to the branch pipes, *e'*. The steam issues near the bottom of the food box, and is thereby distributed throughout the food, a cover being placed on the same to retain the heat. The food is thereby steamed in a quick and effective manner, while, by taking off the steam chest and food box, the furnace may be employed for other purposes.



ANDREWS' APPARATUS FOR STEAMING FOOD

NATURAL HYGROSCOPES.

A very simple and quite accurate little apparatus, for determining the degree of dampness in airor any other medium, may be made from the screw-shaped appendage of the seed of the *pelargonium*. To the species and varieties of this botanical genus the name geranium is popularly given though the pelargonium differs from the true geranium in several characteristics, the most obvious of which are the half shrubby character of the stems and the somewhat irregular fiowers. The mode of constructing the hygroscope is shown in Fig. 1. E is the support of the pelargonium spiral, F, inserted in a block of wood. G S is a light wooden needle or piece of straw fixed by collodion to the spiral extremity. The end, S, turns over a dial, C D, divided as shown. On this circle, zero corresponds to the greatest humidity, and 100° to the greatest dryness. Between these extremes are traced five spiral turns, as the helix does not usually unwind on itself more than four times. Each turn marked is considered as beginning on the diameter, 0 to 100. Thus, for example, if the helix makes two twists and a half, the indicated degree is read on the

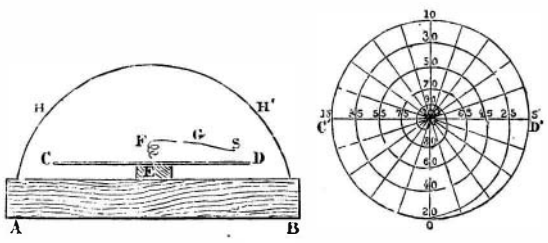


Fig. 1.

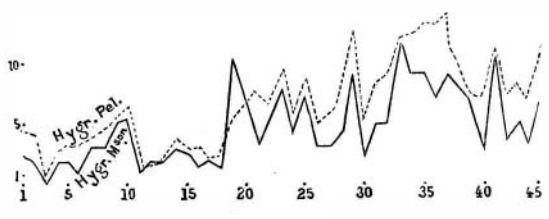


Fig. 2.

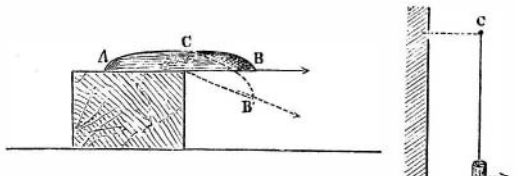


Fig. 3.

Fig. 4.

third turn of the spiral marked on the dial where the needle points to 50°. As the helix is quite fragile, a few copper wires may be arched over it, as at H H', to protect it from chance injury. Fig. 2 shows the indications of the pelargonium hygroscope, as compared with a Mason hygrometer of fine construction. The accordance of the indications in it is quite remarkable.

There are two other hygroscopes noted by *La Nature*, which are even more simple than the foregoing. The first, Fig. 3, is a cork, B, in which a needle is inserted as a pointer, suspended from a nail by a catgut cord. The catgut cord contains more or less twist in proportion to the quantity of moisture in the air. The needle, therefore, as the cord turns, swings in one or the other direction; and by a little experimenting, a dial can easily be made from which its indications may be interpreted. The simplest hygroscope of all is a ginger snap or spice cake, placed on a ledge, as shown in Fig. 4. This kind of cake is very sensitive to variations of humidity in the air; and when dampness is present, it bends, as indicated by the dotted lines, from C B to C B'. During dry weather, it returns to its horizontal position. A straw may be fastened to it as an index, and a dial, as above noted, be constructed by experiment.

NEW YORK ACADEMY OF SCIENCES.

The regular monthly meeting of the chemical section was held at the Mott Memorial rooms, Monday evening, January 15, 1877. Professor J. S. Newberry, President, in the chair. Notwithstanding the inclemency of the weather, the attendance was unusually large. Mr. Geo. F. Kurz exhibited

A NEW MINERAL

from Mexico, which contained sulphur, selenium, mercury, zinc, cadmium, and iron, in fact a sort of cinnabar, remarkable for the large percentage of selenium, about 1·8 per cent. It has been named *guadalcazarsite*, from the locality where it was found. It is said to be sufficiently abundant there to be employed as an ore of mercury, thus furnishing a means of developing the silver deposits. Mr. Kurz also exhibited a specimen of jeffersonite. The first paper of the evening was by Dr. Peter T. Austin, on the

CONSTITUTION OF THE ADDITION COMPOUNDS OF PICRIC ACID WITH HYDROCARBONS.

The author first called attention to the fact that picric acid combines directly with hydrocarbons, like benzol, and that this property is often taken advantage of in preparing perfectly pure hydrocarbons, as some of these picric acid compounds are very finely crystallized, and may therefore be readily purified. Dr. Austin objected to the use of the term physical compounds as applied to these substances, claiming that there is but one class of compounds—namely, molecular compounds. After illustrating, by means of graphic symbols, the probable constitution of these molecules, and offering some facts in substantiation of his theory, he closed by stating that certain substances, like paradinitro-benzol, are more easily prepared from these picric acid compounds than from any other source.

LABORATORY NOTES FROM THE UNIVERSITY OF CINCINNATI,

was the title of a paper by Professor F. W. Clarke, read by the chairman of the section, Professor Leeds. In the analysis of certain minerals, where it is customary to fuse them with bisulphate and fiuoride of sodium, Professor Clarke finds that chloride of sodium may be substituted for the more expensive fluoride with but slight inconvenience. The mixture employed by him contains 3 parts chloride of sodium and 12 parts bisulphate of sodium to 1 part of the mineral. He recommends it particularly for refractory iron ores and for chromite.

Professor Clarke has succeded in preparing a fluoride of nickel containing three molecules of water, Ni F_3, 3 H_2 O. It has a specific gravity of 2·15 at 19°, and retains the water at 130°. He also prepared a fiuoride of zinc with four molecules of water. He was unsuccessful in making the fluorides of gold and of platinum.

Professor Clarke is perseveringly at work on the subject of molecular volumes. (See SCIENTIFIC AMERICAN, June 3, 1876.) He gave a list of 17 haloid salts, with their actual densities (determined by experiment), their molecular volumes, and the theoretical density calculated from their molecular volumes, which agreed in a remarkable manner. In all these cases, the volume was 5·5, 11, 16·5 or 22, all multiples of 5·5 the volume of hydrogen.

NEW METHOD OF DETERMINING FERROUS OXIDE IN SILICATES,

was the subject of a brief paper by Professor A. R. Leeds. It consists in the method of preparing and using hydrofiuoric acid. The ore is pulverized and placed in a platinum dish which is supported on a platinum triangle within a platinum retort or still. The still is charged with fiuorspar and sulphuric acid, and filled with dry carbonic acid. On heating the retort, dry hydrofiuoric acid gas is evolved, which dissolves the ore and removes all the silicon. The carbonic acid is again passed through the retort until cold, when the ore may be removed, dissolved, and titered with permanganate of potassium. This furnishes the best means of determining the amount of protoxide of iron in an ore or mineral. The objection to the use of the liquid acid imported in gutta percha bottles is that it is not strong enough, and contains enough organic matter to render it totally unfit for use in determining protoxide in the presence of the peroxide of iron. Photographs of the apparatus employed were exhibited. It is to be hoped that some less expensive apparatus may be devised for this process, when it will, no doubt, meet with popular favor.

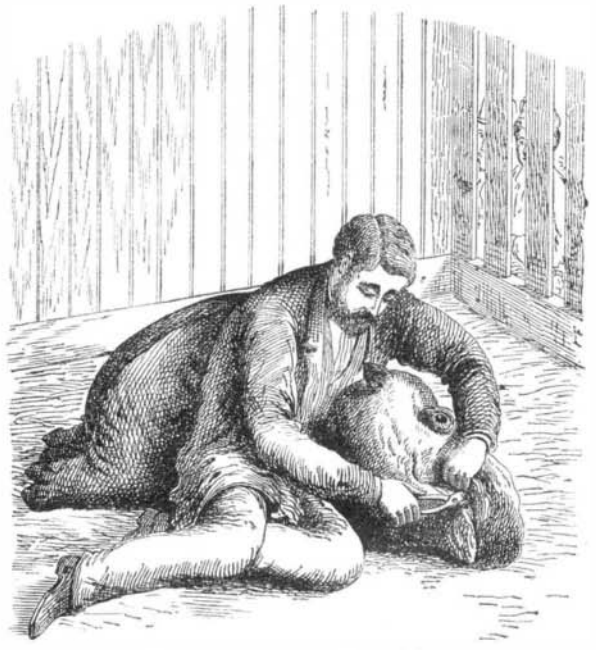
At the conclusion of Professor Leeds' paper, Professor Charles Seeley made some interesting remarks on

HYDROFLUORIC ACID.

This acid is now very largely employed in this city in making the ornamental glass signs, usually supposed to be made by the sand blast. This involves its preparation on a large scale, as some establishments consume 100 lbs. permonth. Iron retorts are employed, and are found to be better than lead, and last much longer than the leaden pipes which are attached to the retorts for condensing the acid. In regard to the physiological effects of the acid, Professor Seeley thinks the text books exaggerate its dangers. On dipping the hand into hydrofiuoric acid, no immediate effect is produced; but if not washed off at once, in the course of half an hour the fingers begin to ache worse than the teeth with toothache; they swell up, and in a day or two the true skin begins to separate and crack open. These sores do not heal for two or three weeks. If, however, the hand is washed immediately in water or dilute alkali, no more inconvenience is suffered than from sulphuric acid. Lead bottles are used to transport it; and although gutta percha will last three times as long, its cost is much greater in proportion. Hydrofluoric acid can be made very cheaply, and sells in quantities at 18 cents per lb. Professor Seeley believed that it could be furnished here sufficiently pure to answer the objections raised by Professor Leeds.

HIPPOPOTAMUS DENTISTRY.

The hippopotamus now at the New York aquarium recently underwent that most disagreeable experience to all



juveniles, the extraction of a tooth. "Baby," as the unwieldy young female is named, is now some twenty months old; and her second set of teeth or tusks are pushing out the rootless milk teeth. This is attended with considerable suffering, and the animal has been very uneasy, constantly rubbing her snout along the floor or against the bars of the