HEATING BY STEAM.

It has been sufficiently well established by experience that the running cost of a steam or of a hot-water plant, where the heating is done by the *direct* plan (that is, with radiators inside the rooms to be warmed) is much cheaper than that of a furnace in the same house heating the same rooms. It may safely be put at fifteen per cent. less, and in favorable conditions even a larger saving could be made. With *indirect* steam heating, where the steam is used to heat chambers of air in the cellar, supplied from the cold air outside and conducted, after warming, by flues and through registers, after the plan of the hot air furnace, there is very little, if any, saving of expense. Some people prefer this method, because they dislike radiators; but it should always be remembered that the direct method is the cheaper. Steam heating by either method has manifest advantages over furnace heating, especially in the entire absence of dust, the plague of a furnace-heated house, which the best made apparatus cannot keep from the rooms. A steam plant is more durable than a furnace and requires little care, the important points being to keep the grate clear and the boiler clean. Keeping the grate clear is important in all fires, as fuel is wasted where the under draft is choked. Steam heating apparatus is supplied with automatic dampers, which regulate the draft. The cost of a plant is not so great proportionately for a large house as for a small one. One adapted to heating 15,000 cubic feet, which is about the amount of space in an average-sized eight-room house, will cost, all complete, from $375 to $425.

A hot-water plant costs about ten per cent. more than a steam plant for the same space to be warmed. The running cost the season through, is less than with steam, though during very severe weather the consumption of fuel will be somewhat greater. This is more than offset by the much less expense during the milder periods, when the fire in a hot-water boiler can be run very low. There is about the same difference between the cost of direct and indirect heating as with steam. In indirect heating, the hot air flows through the room and passes off, it being necessary to provide for its escape in order to keep up the flow of cold air into the heating chambers. But in direct heating, the air of the room is warmed over and over and a less degree of heat in the radiator is needed to keep up the temperature of the room. In steam heating, whatever the weather, the fire in the boiler must always be kept up hot enough to make steam, otherwise there will be no heat. In a hot water plant the circulation of the water in the pipes can be maintained with a fire that would not make steam. This is the principal reason why hot water is cheaper than steam. Another advantage is that in starting a new fire in a hot-water plant, the water begins to circulate in the pipes the moment the fire begins to raise its temperature, and very soon gives off heat; whereas in a steam boiler no heat can be had till the fire has burned long enough to raise all the water in the boiler to the steam point. Again, in case of the fire going out, through neglect, if it is at once renewed the water in the pipes will not cool sufficiently to cool the rooms.—*Good Housekeeping.*

An association of women is about to start in business to undertake by contract, the care of London conservatories, window-boxes, balconies, and small gardens, by the year, season or month. The members of the association will themselves attend to all orders, employing men for the digging and rough work only. Plants will be received and tended at the premises of the association during the absence of the owner from town. The title of the new business is the Women's London Gardening Association.—*Vick's Magazine.*

Never before in all the history of mankind, says Professor Flammarion, have we had in hand the power to penetrate so deeply in the abysses of the infinite. Photography, with its recent improvements, takes a fair picture of every star, no matter what its distance, and sets it down on a document which can be studied at leisure. A star of the fifteenth, sixteenth, or even the seventeenth magnitude, or a sun may be separated from us by so great a distance that its light requires thousands, perhaps millions, of years to reach us, notwithstanding its incredible velocity. The unaided eye of man would never have seen it, but the camera collects this feeble light, and after a prolonged exposure reveals its image.—*Outing.*

For the sake of illustrating the difference between the practical man and theorist, let us suppose two persons to visit the northern peninsula of Michigan seeking for iron. The one runs along blindly, takes up with every good show, and mines. The result is, he either makes a happy strike by mere accident, or spends thousands of dollars in useless search. The other has studied the laws of electricity, and knows that certain ores of iron are magnetic. He understands also that these ores will exert their influence through any amount of superincumbent earth. Consequently he provides himself with a dipping-needle and compass, and by the operation of these tells where a bed is located, its approximate depth, and probable amount of material. To prevent being deceived by the magnetic schists in that region, by means of his dipping-needle and compass he traces up the bed until he finds an outcrop. Thus have been located, at little expense, many of the mining regions of that locality. What an achievement is this, and how much better than the blind guesses of the so-called practical man? —*Popular Science Monthly.*

We have now completed our tour of the woolen mill and our hasty examination of the machines which have superseded the earlier inventions in these establishments. Not less striking than their wonderful ingenuity is their multiplicity. We find not only a separate machine for each of the twenty-three different operations enumerated by Ure in 1834, but we also find, in the larger mills, great numbers of these separate machines. A modern factory is, therefore, something almost entirely different from anything which existed a century ago. It contains vast rooms, each devoted to separate branches of the industry. In one we find the scouring machines; in another, the carding machines; in another, if it be a worsted mill, the combs and gilling machines; in another, long rows of whirling spindles tire the eye, and in another the clatter of hundreds of looms suggests pandemonium. Everything is systematized, and the surroundings of the operatives, with abundance of light, with perfect ventilation, with steam heat, with convenient retiring rooms, justify the statement that the gain of the manufacture through improved machinery is no greater than the gain of the operative, which has come through the accompanying improvement in the construction and arrangement of the buildings in which these operations are conducted.—*Popular Science Monthly.*

Here are some figures which, by comparison, will show the importance of the "Soo" Canal to commerce—an importance little suspected by the public generally. The traffic of the Suez Canal for 1890 was 3,389 vessels, registering 6,890,014 net tons, as against 3,425 vessels and 6,783,187 tons for 1889. The traffic of the Sault Ste. Marie Canal, during 234 days navigation was open in 1889, was 9,576 vessels and 7,221,935 net tons, and in 1890 it was 10,557 vessels and 8,454,435 net tons—that is to say, in 1889 the lock at the "Soo" passed 11 per cent. more tonnage than the Suez Canal, and in the 228 days that the canal was open last year, 22.8 per cent. more tonnage passed through it than through the Suez Canal. This commercially great but little known strip of water has been the direct cause of the railroads losing freight amounting to more than 200,000 000 bushels of wheat, 5,000,000 tons of coal, iron ore and copper, and many thousands of tons of North-Western products during the last few years. It is easily to be surmised that when the great work now in course of construction is completed, which will be in about two years, the railroads will suffer from keener competition in proportion with the increased depth and capacity of the canal, which will permit through lake shipments at cheaper rates of freight, and with greater convenience to those who live and produce in the great lake districts.—*The Illustrated American.*

An extremely interesting experiment has been proceeding at the Bon Accord Salmon Cannery during the past week, namely, the packing of salmon in glass jars. The glass jars were manufactured in England, and are of the capacity of an ordinary one-pound can. They are rendered airtight by an appliance similar to that used in fruit preserving jars, a zinc screw cap fitting over a rim of rubber in such a manner that the zinc and rubber do not come in contact with the fish. The cooking process is performed in precisely similar manner to that employed in an ordinary canning, a puncture or "blow hole" being left in the glass cap. After the cooking is finished this puncture is closed with sealing wax. The experiment is regarded as highly successful, the only drawback being the cracking of some of the jars occasioned by the sudden change of temperature upon being removed from the oven. It is believed, however, that this will be wholly obviated by the use of another description of glass. In all, some fifteen or twenty cases were put up, and these will be shipped to the Old Country. Fish packed in this manner would cost about 50 per cent. more than the ordinary canned article to the consumer, but they would command a ready sale among a class of people to whom the extra cost would be no obstacle in purchasing. There has always been a more or less pronounced antipathy in England to canned goods of all kinds, and although it is perhaps felt less now than at any time heretofore, owing probably to the uniform excellence and wholesomeness of the Fraser River pack, still there is a considerable section of the more wealthy class of people who would always give the preference to fish preserved in glass.—*Westminister, B.C., Ledger.*