

of the strap, causing the jib to wear out very fast; furthermore, the back brass condenses the metal at the back of the brass opening, acting to pene it and throw the points of the rod-end open, which it always does, the jaws of the jib embedding in the jaws of the rod. This opening of the rod-jaws makes the brasses loose in their places; hence this is a weak and undesirable form of rod-end, though very convenient to take on and off. In Figs. 11, 12, 13 and 14 are shown a form of solid-ended rod of more modern construction. In this case a wedge (A) is used instead of a key being adjusted by screws passing through the rod at the top and bottom, it being obvious that the set-screws may have check-nuts added. B is the back brass, and C the key brass. In this case the flange of the brass goes next to the crank-pin, and a plate, D, is provided to serve as a flange on the front face of the brass. In Fig. 11 this plate is removed to show the wedge, A; but it is shown in the Plan View 12 and the End View 13, and by itself in Fig. 14. A groove is cut on each side of the two brasses and the plate spans, the brasses passing up the groove, being held in position by a screw at E. The opening for the brass (in the rod-end) is here shown wide enough for the rod-end to pass over the crank-pin, but in many cases, with this as well as with other forms of solid-ended rods, the crank-pin may be made plain, that is without a flange, and have a washer secured by a screw (as shown in Figs. 11, 12 and 13), so that by removing the washer the rod may be put on with the brasses already in place, and made no thicker (at the joint face) than is necessary for strength. In Fig. 15 is shown what may be termed a clip-end connecting-rod, the screw closing the rod-end (to take up the wear) against the spring of the metal. It is obvious that in this case the hole may receive a brass brush split as is the rod-end and secured from turning by a pin. Fig. 16 presents another form of solid end-rod, which admits of the use of a brass having a flange on both sides of the strap, and will take on and off by removing the cap, B. If the crank-pin collar is solid, the brasses must be placed on the crank-pin, and the rod, with the wedge in place, lifted or lowered to the brasses; but if the crank-pin has a washer and screw, the rod may be put together and slipped on its place.

HOW TYPHOID FEVER MAY BE PROPAGATED.

In a recent number of the *Popular Science Monthly*, Ely Van De Walker, M.D., of Syracuse, N. Y., under the title "Typhoid Fever Poison," reports seventeen cases of the fever in an isolated suburb of the city in which there were but fourteen houses. The first case was imported; thence through the overflow of the privy in which all the excrement of the patient had been thrown, a well became contaminated. All the persons who were taken ill used this well. It was the constant or occasional source of supply of seven of the fourteen families. No cases occurred in households where the inmates did not use this well. Some cases were developed in every family who drew water from it. The families who escaped were exposed to every other influence but that of this particular well; their own water supply was the same, less the privy contamination. It is not unlikely that their own wells received some of the overflow from their own vaults, but as these were free from typhoid poison, no ill results ensued.

About eight years since, Dr. Flint, who has studied and written a great deal on the subject, became satisfied that a source of typhoid fever existed which was little dreamed of, and which at first thought would seem impossible. This source, as he then enunciated it to his home medical society (and not to his knowledge having been before suggested), is found in ice. If this idea is thoroughly investigated, it will not appear to be very problematical. In the first place, the poison is not destroyed or impaired by freezing (some one long ago remarked that ice often masks or conceals what it does not kill). Now, whence comes our ice supply? Often from shallow reservoirs in the midst of neighborhoods of large towns purposely made to receive surface drainage from all around, under the erroneous idea that no harm will ensue, as freezing is supposed to purify and render harmless what might otherwise be objectionable. Great quantities of ice are taken from canals, from creeks, from stagnant ponds, and from streams that are either the natural or artificial recipients of surface drainage, of the outpourings of sewers, and of uncleanness from various sources. The danger from ice taken from improper places is not only from that which is drunk, but from its use in refrigerators and preservatives, where milk, butter, fruits, vegetables and meats are subjected to its saturating influences as it vaporizes. Several instances have fallen under the doctor's observation where the disease, by the most careful investigation, could not be traced to any other source; and if we accept as a

fact the statement positively made by Budd in the *London Lancet*, in July, 1859, that it never originates *de novo*, but proceeds from a special and specific poison which is capable of diffusion to a great extent, and which preserves its noxious qualities for a long period, even if buried for many months, we cannot reject the hypothesis of ice infection; and it is hoped that it will be made the subject of very thorough and careful investigation.

WHITE AFRICANS.

Major Pinto, the Portuguese explorer, who has just crossed Africa, from Benguela southwestward to Natal, describes a race of white men found by him near the headquarters of the Zamberi. He says:

"I one day noticed that one of the carriers was a white man. He belonged to a race entirely unknown up to the present day. A great white people exist in South Africa. Their name is Cassequer; they are whiter than the Caucasians, and in place of hair have their heads covered with small tufts of very short wool. Their cheek bones are prominent, their eyes like those of the Chinese. The men are extremely robust. When they discharge an arrow at an elephant the shaft is completely buried in the animal's body. They live on roots and the chase, and it is only when these supplies fail them that they hold any relations with the neighboring race, the Ambuelas, from whom they obtain food in exchange for ivory. The Cassequeres are an entirely nomadic race, and never sleep two nights in the same encampment. They are the only people in Africa that do not cook their food in pots. They wander about, in groups of from four to six families, over all the territory lying between the Cuchi and the Cubango. It would seem that from a crossing of the Cassequeres with the negroes of other races sprang those mulattoes of the south, whom the English call Bushmen. The latter are, however, better off than the Cassequeres, and use pots in cooking their food, while their dispositions are good, though quite opposed to civilization."

Unfortunately Major Pinto does not say whether he saw more than one of the white African he describes, or whether the account he gives of them is based on observation or on hearsay. His promised book may clear up the matter.

INCOMBUSTIBLE WOOD

The following chemical compound is said to produce the result claimed by M. M. P. Folbarri for rendering wood incombustible, petrifying it, as it were, without producing any change in appearance. Intense heat chars the surface, slowly and without flame, but does not penetrate to any extent, and leaves the fiber intact:

Sulphate of zinc, 55 lb.; American potash, 22 lb.; American alum, 44 lb.; oxide of manganese, 22 lb.; sulphuric acid of 60°, 22 lb.; water, 55 lb.; all of the solids are to be poured into an iron boiler containing the water at a temperature of 46° C., or 113° Fah. As soon as the substances are dissolved the sulphuric acid is to be poured in little by little, until all the substances are completely saturated. For the preparation of the wood it should be placed in a suitable apparatus, and arranged in various sizes (according to the purposes for which it is intended) on iron gratings, care being taken that there is a space of about half an inch between every two pieces of wood. The chemical compound is then pumped into the apparatus, and as soon as the vacant spaces are filled up it is boiled for three hours. The wood is then taken out and laid on a wooden grating in the open air, to be rendered solid, after which it is fit for uses of all kinds.

BROWNING'S STONE VARNISH.

Respecting the colorless preservative solution by which Cleopatra's Needle has been covered, a correspondent recently wrote to the *Times*: "In operating upon the granite, Mr. Browning first gave it a thorough cleansing, removing all the sooty and greasy matters from the surface, and then indurated it with his invisible preservative solution. The effect has been to give a freshness to the granite as if only just chiseled from the rock, retaining the original color, disclosing the several veins, the white spar shining in the sun's rays like crystals, and exhibiting the polished portions as they formerly existed. The solution soaks well into the pores of the granite, and the best authorities consider that it will have the effect of thoroughly preserving the monolith. Mr. Henry Browning has personally superintended the operations."