gain in time would hardly compensate for the loss that is inevitable if commercial arrangements which have taken centuries to mature should be disturbed or destroyed.

When, for example, it is proposed to erect a bridge with a massive pier in the very middle of the waterway, or a bridge of a height that will prevent many of the vessels that trade with London from passing under it, or a bridge on so ingenious a principle that there is risk of the intricate machinery becoming disarranged in the opening or closing, it is evident that in every one of those cases there is a certainty of interference with the traffic of the Thames, and the trade of the port will in consequence be sacrificed to local interests. On the other hand, a fixed bridge at a high elevation above the river would involve local inconvenience, for it must be costly, and unless the approaches are carried for a great distance inward, the gradients will be steep and involve a loss of tractive power.

If the foregoing assumptions are correct, it is evident that the question of constructing a bridge over the Thames below London Bridge is one in which compromise is demanded if there is to be a satisfactory solution. Something must be abated by all parties, by the representatives of land traffic as well as by the riverside proprietors. It is physically impossible to have a bridge with easy gradients for land traffic, and which will be also clear above the highest masts, or one on a low level which shall still be equally convenient for ships and wagons; and the most prudent course will be to construct a bridge on a principle that will give a minimum of inconvenience, while allowing of easy gradients and a capacious waterway. In the opinion of the special committee of the London Corporation, who were appointed to investigate this question, the design which is illustrated by us this month complied with those conditions. The committee reported that the design commended itself to them "as one providing a bridge which would interfere but very slightly with the river traffic, and would bring about that relief to the commerce and trade of this city contemplated by the references to your committee."

It will be seen from the illustrations that the City Architect has adopted the bascule principle for his bridge, as being simple in arrangement, economical, and convenient, besides admitting of that architectural effect in the towers which is necessary for a structure placed is so important a position. In one view the bridge is open, and in the other closed.

The proposed bridge, having in its centre the same height of waterway as London Bridge, viz., 20 feet, would consist of two side spans of 190 feet each, and a centre span or opening of 300 feet. The roadway of side spans would be carried by two wrought iron lattice girders, of ordinary type, or by shallow lattice girders carried by suspension chains from the towers, with girders spaced 35 feet apart, and cross girders between, carrying buckled plates on which the railway would be bedded.

The center span of 300 feet would be bridged by two hinged platforms, forming the "bascule." The longitudinal and cross girders and buckled plates of the platforms are all proposed to be steel, to reduce the weight as much as possible. Each platform would be suspended by eight pitched chains, passing over polygonal barrels fixed in the semicircular arches between the towers, and from thence to the hoisting machinery in the towers, where they would terminate in a plain chain or iron rod carrying the balance weights.

The hoisting machinery could be worked by steam power, or by hydraulic apparatus, supplied by tanks fixed in the roof of the towers.

The arches between the towers carrying the polygonal chain barrels would be formed of four wrought-iron braced semicircular arched ribs, connected transversely by four wrought-iron lattice frames. The rise of each arch in centre would be 130 feet above Thames high-water mark, or of 100 feet headway for a width of at least 150 feet.

The principal advantages of the design proposed are:

First. Lowness of level and, consequently, *easy gradients for the land traffic.*

Second. *Economy of construction* in the approaches on both banks of the river, the lowness of the level allowing of direct access, and necessitating very slight alterations of the adjoining streets and properties.

Third. *Occupation of less river space* than a swing bridge, which, when swung open, requires a clear space equal to the half span of the bridge.

Fourth. *Less interference with the tide-way* or navigation of the river, there being only two towers or piers, instead of three or four, as in the swing bridge schemes.

Fifth. *Beauty of form.* The chief features of the bridge being capable of architectural treatment, it might be rendered the most picturesque bridge on the river.

Sixth. *Facility and rapidity of working* by the special arrangements of machinery proposed. For instance, a ship signaled at a quarter of a mile distant, and sailing or steaming at the rate of, say, six or seven miles an hour, could pass through the bridge and the land traffic be resumed in three minutes; or if half a dozen vessels were within half a mile of the bridge, all could pass in five and a half minutes.

It has been estimated that the cost of the bascule bridge, including approaches, machinery, maintenance, etc., would not exceed 750,000*l.*, which is about one-half the sum that would be necessary for the construction of a high level bridge allowing of equal facilities for the river traffic.—*Scientific American.*

Health and Home.

HYGIENE OF MOUNTAIN CLIMBING.—Dr. Brenner advocates exercise in the high, fine air of mountains as the best protection against the diseases contracted in city life. The characteristics of the mountain climate are the low temperature and air-pressure, the low relative humidity, the high per cent of ozone, the strong light and insolation, the freedom from dust and bacteria. All these act well on the bodily health. The lungs work with greater strength, the heat beats faster, the blood circulates more quickly, appetite is increased, perspiraton becomes freer, the muscles become more energetic, and the whole body gains in strength and endurance.

LONDON WATER.—Mr. Crookes and Professors Odling and Tidy have lately given in their Report, on the composition and quality of London water during 1882, to the Local Government Board. In that year they examined 2110 samples of water drawn in nearly equal proportions from the mains of all the seven London Companies; testing generally even samples daily by their colour according to the register of the colour meter, by the quantity of free oxygen and ammonia contained in them, by the amount of oxygen required for oxidation of the organic matter present in them, by their proportions of organic carbon and nitrogen, of nitrates and chlorine, and by their initial hardness in degrees of Clark's scale. The results exhaustively set forth in numerical tables are further illustrated by seven diagrams, in each of which three wave lines represent the fluctuations throughout the year of discoloration, of the proportion of organic carbon, and of the amount of oxygen required to oxidise the organic matter of the water of the London Company in question. These diagrams show to the eye what the statistics confirm, the remarkable parallelism existing between the degree of discoloration, the amount of organic carbon present in the water as determined by combustion, and the amount of oxygen requisite for oxidation of the organic matter as determined by permanganate. The Report altogether would seem to reflect most favourably on the quality of London water. Throughout the whole year the water of the New River Company as determined by the samples was, without exception, "clear, bright, and well filtered," a character supported by analyses of other kinds, and in only a few cases, in the samples of the other Companies, was the water describable as "turbid," "slightly turbid," or "very slightly turbid." For the nine months from February to October 1882 the organic matter in the water of all the London Companies is estimated at ·137 per 100,000, and the highest monthly mean for the same period at ·181 per 100,000. There is, however, one important factor in the question with which chemical analysis cannot directly cope, the comparative innocuousness, namely, of the organic matter present in the water according as it is of vegetable origin, or its comparative virulence according as it is of animal origin. As Prof. Huxley, in a lecture in 1880 to the Chemical Society, said, water as regards chemical analysis may be perfectly unobjectionable, and yet as regards its operation on the human body deadly as prussic acid.

POTATO DISEASE.—We learn from *Naturen* that a hitherto unknown form of the potato disease, which had been making slow but steady progress near Stavanger during the last ten or twelve years, has recently begun to show increased energy. The stalk of the plant is the part affected, and here Herr Anda has discovered small white fungoid growths, which after a