### Proposed English Channel Bridge.

A recent project is the scheme for bridging the English Channel, put forth by M Verard de Sainte Anne, France. He maintains that his bridge scheme is preferable to the tunnel scheme, because its execution would not cost more than 300,000,000 francs, whereas the tunnel could not be constructed for less than 500,000,000 francs. M. De Sainte Anne, moreover, affirms that his viaduct could be constructed in a much shorter space of time than the tunnel.

As described in the London *Standard* the proposed viaduct is to span the Channel from Cape Grisnez to Folkestone. According to the Admiralty soundings the greatest depth of water to be found on the passage is fifty five meters, and this is only for a distance of some four kilometers about half way between the Varne Rock and the French coast. This Varne Rock and its neighbor, the Calbart Reef, play an important part in the scheme. The former, situated at fifteen kilometers from Folkestone and twenty kilometers from Cape Grisnez, is some four kilometers broad, covered with no more than from two to fifteen meters of water. Being of solid rock, and in a direct line with the projected viaduct, it offers itself as a natural half-way resting place. This rock has, till now, constituted one of the greatest dangers to the navigation of the Channel. M. De Sainte Anne proposes not only to turn it to account by using it as the foundation for a portion of the viaduct, but also, in conjunction with the Calbart Reef, for the construction of a free port in which vessels of the greatest tonnage will be able to seek shelter from the storms so frequent in the strait which separates England from France. Both for the construction of this port and for reducing the depth of the water to twenty meters in those places where he will be obliged to construct his columns, M. De Sainte Anne proposes to adopt the method employed in the construction of the Cherbourg breakwater, which consists in dropping huge masses of rock into the sea, and in consolidating them by means of Roman cement.

On the foundations thus established it is intended to raise solid masses of masonry to some forty meters above the level of the sea. This is, of course, a gigantic work, the immensity of which will be seen at a glance, when it is remembered that M. De Sainte Anne does not contemplate attempting in his viaduct any span exceeding two hundred meters. The distance from Folkestone to Cape Grisnez being thirty-five kilometers, it will, therefore, be necessary to construct at the very least 175 immense blocks of masonry on which to place the superstructure. As to the superstructure itself he proposes to employ three systems. On the Varne Rock and at the two extremities where the water is shallow and the exigencies of navigation permit, he proposes to construct solid stone arches which will have nothing to fear from the fiercest tempest. This massive masonry is to be followed by the girder bridge system, such as employed in the Charing Cross railway bridge. But to span the deep water he has recourse to the tubular bridge system as applied by Sir Robert Stephenson in the erection of the Menai bridge. With these three systems combined he believes that he is not only certain to succeed in crossing the Channel, but also in satisfying the demands of every government concerning the precautions to be taken to prevent the navigation of the English Channel being rendered even more dangerous than it is at present.

### The Bite of the Skunk.

In the *Forest and Stream*, of recent date, is a contribution to the question whether the bite of the skunk is poisonous and will produce rabies. In the West and Southwest of the Mississippi Valley this seems generally believed. A writer from Colorado quotes several instances.

Dr. Cushing, of Trinidad, Colorado, who has, no doubt, seen several cases, gives it as his opinion that the natural bite of the skunk produces hydrophobia—that it does not need to be suffering from rabies itself. He says its bite will kill the victim sooner or later, without fail. Dr. W. L. South, who has had great experience in Texas and New Mexico, says "the bite will fetch the victim some time," meaning that it will sooner or later result in death.

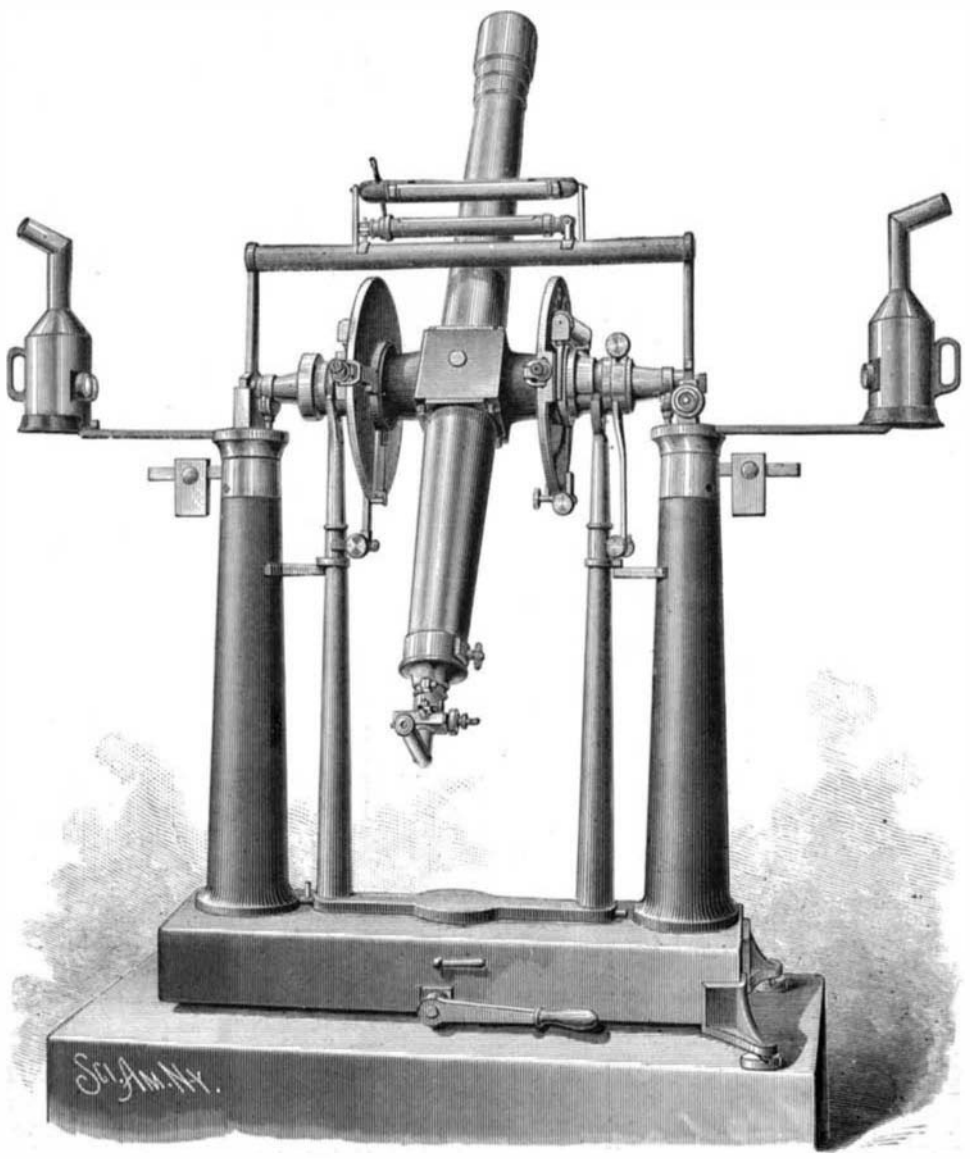
We do not believe this is the case in the Eastern States. The skunk is very common in Pennsylvania. We have seen dogs bitten by it, and have known those who hunted it constantly for its valuable skin, but have never heard of any such ill result from its bite either in man or dog.—*Medical and Surgical Reporter*

### Relation of Religious Belief to Epidemics.

The Montreal *Witness* states that diphtheria is more prevalent among the Protestant section of Montreal community than among the Catholic. It is not a mere coincidence, nor is it of a temporary character. A study of the health statistics of Montreal for several years past reveals the same state of things. It is the more peculiar, inasmuch as the general death rate is much higher with the Catholics, particularly so in contagious diseases, and conspicuously so in the case of smallpox. But these admit of explanation. The only solution of the problem seems to be that the bulk of the Protestant community reside in the upper part of the town, where the drainage is less perfect than in the lower town.

### NEW FORM OF TRANSIT INSTRUMENT.

The engraving represents an instrument made by Fauth & Co., of Washington, D. C., of the same class as the one described in our issue of August 23, being a transit instrument of smaller and more portable size. This instrument—of which quite a number have been made by Fauth & Co. for colleges in this country, as well as Mexico and Japan—is complete in itself, having base, standards, and reversing apparatus all in one piece, and is, as a glance at it will show, "American," being as convenient and adapted to the purpose as it can well be. As generally made, this instrument has a telescope of 3 inches aperture; the circles, which are divided on the edge, the graduation thus facing the observer, are from 12 to 13 inches in diameter; the latitude and striding level are sensitive to single seconds and chambered. Improved machinery, division of labor, and the great saving of time by only finishing the parts that require it, enable this firm to successfully compete in price with European makers. All the parts not polished are coated with "flocking." This finish gives the instrument a beautiful appearance, and makes handling comfortable, especially in cold weather.




FAUTH & CO.'S PORTABLE TRANSIT INSTRUMENT.

### Prosperity in the Lumber District.

According to the *Northwestern Lumberman* the lumber interests of the West, which have been so greatly depressed along back, are now prosperous. There is a sharp demand for lumber, and thus far light receipts, which is pushing prices upward. From the same source we learn that the Hon. Erastus Corning, of Albany, N. Y., has formed a connection with Wm. H. Gratwick & Co., of Tonawanda and Albany, and Oscoda, Mich., for the handling of his entire stock of lumber, embracing some 200,000,000 feet, the product of his large and valuable tract of pine timber on the western shore of Michigan. This gigantic enterprise comprehends about $4,000,000 in value, supposing the lumber to have been marketed. Gratwick & Co., who own about 30,000 acres of fine timber land, will curtail the cutting from their own lands somewhat while the Corning tract is being operated.

### Photography of the Spectra of Geissler's Tubes.

The spectrum of *hydrogen*, which appears to the eye to consist of only four lines, showed when photographed upon gelatine plates, besides these four lines, hundreds of lines in the blue, violet, and ultra (invisible) violet. Many of these are light and delicate, while some are of extraordinary density. Among these are, besides the mercury lines, four lines in the ultra violet and one which coincides with the thick first H line of the sun's spectrum. The length of the undulations of the lines was measured, and their position as respects the Fraunhofer lines of the sun's spectrum determined.

The spectrum of *mercury* in the Geissler tube furnished in the photograph, besides the remarkable lines in the blue and violet which Thalen saw and measured, a surprising group of lines lying far into the ultra violet (length of the wave of the outermost, 3650). The spectrum of the mercuric spark in the open air coincided in many points with the spectrum of mercuric vapor in the Geissler tube, but it also differed from it in a surprising way. Thus, in the spectrum of the Geissler tube, the distinct line close by H in the violet was absent, while, on the other hand, in the violet and ultra violet it showed a variety of bands which were not present in the spectrum of the spark in the open air between the poles of mercury.

The spectrum of *nitrogen* in the Geissler tube furnished a very characteristic photograph, with magnificent lines in the violet and ultra violet. Several of the latter far exceeded in intensity the visible lines in the violet. The appearance of the lines in the photograph was quite different from that which is given to them in ordinary drawings; they formed no simple shaded-off bands, but sharply defined lines, at the most strongly refrangible side of which lay a weak, washed-out looking band.

The nitrogen lines in the pale blue, which appear strongest to the eye, exercised but a slight action on the photographic plate, and on the green lines even a slighter.

If nitrogen and mercury be both inclosed simultaneously in the same Geissler tube, with a spark one gets the lines of both elements; but if the tube be warmed, the nitrogen lines disappear and only the mercury lines remain. This has already been observed by Herr C. Wiedemann. Thus, if one were to photograph upon the same plate the spectrum of a nitrogen tube containing mercury in a cold and in a warm condition, he would easily get the spectrum of nitrogen and that of mercury together, and by comparison he would be able to recognize which lines belong to one element and which to the other. The nitrogen spectrum reaches as far into the ultra violet as the mercury spectrum.

Then I photographed the spectrum of an electric spark struck through atmospheric air, oxygen, and carbonic oxide gas. Thus upon one and the same plate we had all together the spectra of oxygen, atmospheric air, and carbonic oxide gas. The comparison of the pictures showed that the carbonic oxide gave by preference oxygen lines, and that by the spark it was decomposed into oxygen and carbon (the latter was actually visibly drawn out to the poles.)

It was further observed that the spectral lines which are ascribed to the atmosphere are very different in character according as the different poles are used. For example: the spectrum of the air between mercury poles is very matt and undetermined; that obtained between platinum and aluminum poles is much more brilliant. Many of the lines in photographs of spectra of the air obtained in this way coincide, but many others do not, showing undeniably that the spectrum of one and the same substance may suffer by the presence of modifications which are very likely to arise. The changes in the spectrum of certain elements—as calcium, lithium, iron—which Lockyer ascribes to a decomposition of the elements, should therefore rather be attributed to the influence of foreign substances. The photographs which were obtained will appear, reproduced in lichtdruck, in the report of the Academy of Sciences.—*Dr. H. W. Vogel in Mittheilungen.*

According to a German authority (*Pharm. Zeitung*) a very handy sulphureted hydrogen apparatus may be made by putting into a large test tube, fitted with a cork and delivery tube, a mixture of equal weights of paraffine and sulphur. On applying heat hydrogen sulphide is given off, and on withdrawing the lamp the evolution of gas at once ceases, so that the same mixture may be used many times and will last for a long period.