PROPOSED NEW BRITISH POLAR EXPEDITION.

Our readers are probably aware, says the London *Graphic*, that an influential Central Committee has been formed, to which forty-nine provincial committees are affiliated, for the purpose of organizing an expedition to the North Pole on the plan recommended by Commander Cheyne, R. N., who is strongly of opinion that balloons will form an important element in all future Arctic explorations.

Our illustration depicts the three balloons as ready to start from the winter quarters of the ship during the first week in June, their destination being the North Pole. The average temperature in the early part of June is about 25° Fah. The balloons are named Enterprise, Resolute, and Discovery; each will be capable of lifting a ton in weight, the three carrying a sledge party intact, with stores and provisions for fifty-one days. The ascent will be made on the curve of a roughly ascertained wind circle, a continuation of which curve will carry them to the Pole, but should the said curve deflect, then the required current of air can again be struck by rising to the requisite altitude, as proved by experiments that different currents of air exist according to altitude; this fact Commander Cheyne himself observed when, in charge of the government balloons in his last expedition, he sent up four at the same moment to different altitudes; being differently weighted, they took four different directions to the four quarters of the compass, giving him his first practical idea of ballooning in the Arctic regions. Captain Temple's experiments with the war balloons from Woolwich Arsenal have fully confirmed this important desideratum in aerostation.

About thirty hours would suffice to float our aeronauts from the ship to the Pole, should all go well. We asked Commander Cheyne how he was going to get back; his answer was cautious: "According to circumstances," he said, "My first duty is to get there. When there leave it to us to get back. We have many uncertainties to deal with, and a definite programme made now might be entirely changed when the time came to carry out the journey south. Condensed gas would be taken in steel cylinders, hills would be floated over by expansion and contraction of the balloons, and in the event of any accident occurring, we always have our sledge party with sledge, boat, stores, and provisions for fifty days intact and ready for service." Scotland has taken up this novelty in Arctic exploration with avidity, and England, though more cautious in the matter, has at last given her adhesion to the project being carried out. Canada is likely to join, and Commander Cheyne has received an invitation from the Canadian Minister of Finance, Sir Samuel Tilley, K.C.B., to deliver his lectures in Canada, with the promise of a warm reception.

Atlantic Temperatures.

From the coast-station observations of the Weather Bureau it appears that the maximum temperature of the water in the months of July and August respectively is: At Jacksonville, Florida, 87·75 and 88·25 degrees; at Charleston, S. C., 86·00 and 87·25 degrees; at Wilmington, N. C., 85·50 and 88·50; at Norfolk, 81·00 and 82·25; at New London, Conn., 70·66 and 74·00; at Wood's Holl, Mass. (near Nantucket), 76·25 and 75·25; and at Portland, Me., 60·25 and 60·50 degrees. A very noticeable fact, apparently established by these data, is that the sea water bathing on the coasts and inlets all the way up to Portland is slightly warmer in August than in July, the greatest difference noted being found at New London, where the August temperature is three and a third degrees higher than that of the preceding month. If we tabulate all the observations from Jacksonville to Portland, the average temperature for July is 78·24 degrees, against 78·85 for August.

The lowest August temperatures of the water at Norfolk average 72·00 degrees; at New London, 65·25; and at Wood's Holl, Mass., 69·00. There are no reports for Cape Cod and the Jersey beach, but it is probably safe to assume that the waters on the latter are seldom, if ever, chilled below 70 degrees in August, and that on the east sides of Cape Cod and thence to Newport it is rarely that the August sea temperature falls below 69 degrees.

Timber in the English Colonies.

The English Government has been collecting information from the colonies as to their timber supply. It appears that during the five years ending 1876, Canada sent England about $125,000,000 worth of timber. In Nova Scotia the approximate amount of timber-producing land was, in 1875, computed at 9,000,000 acres; in Ontario, 30,000 square miles; in Quebec, 78,711,114 acres; New Brunswick, 6,000,000 acres. In British Columbia about 110,000,000 acres are covered with timber. Newfoundland, too, is densely wooded, but forest fires have there, as also to a considerable degree in Canada, made serious inroads. In Natal (Africa) the Crown forests have for some time been suffering so seriously from the depredations of the natives that the surveyor-general has absolutely prohibited the use of forest lands for the cultivation of crops.

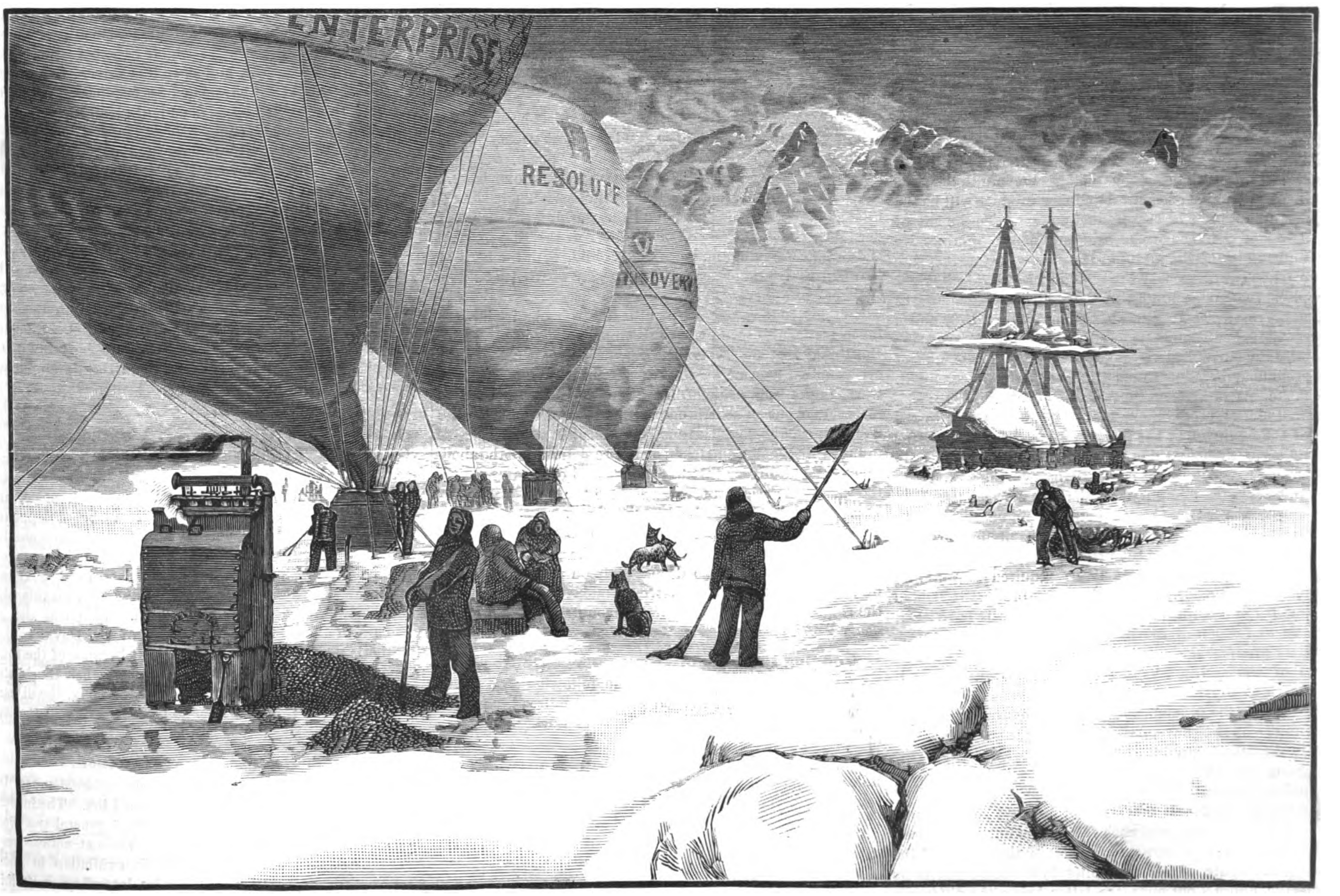
It is computed that Cape Colony has between 500 and 600 square miles of forest. Between 1868 and 1878 British Honduras sent 34,000,000 feet of mahogany. In Victoria, Australia, timber is diminishing far too rapidly, and in western Australia the Governor thinks that steps must be taken to arrest destruction. In Queensland an annual license fee is exacted from wood cutters, and an officer has been appointed to report on the public timber-producing lands, with a view to their conservation. Tasmania (Van Diemen's Land) has about 8,000,000 acres under timber, of which about 1,000,000 are in private hands. In Ceylon steps were some time since taken to arrest reckless destruction. In Queensland and South Australia the clearing of the forests has produced no effect whatever on the rainfall. In St. Helena, on the other hand, where the destruction of the trees shortly after colonization of the island was followed by a succession of severe and destructive droughts, now that the forests have been allowed to grow again there has been much less trouble on that score. The climate of Jamaica is reported much drier of late years in the south side of the island, where the greatest clearances have been made.

IODINE AS A SUBSTITUTE FOR QUININE.

The power possessed by iodine over malarial troubles seems to have been known many years ago, but the knowledge was evidently confined to few, and not appreciated as it ought to be. Recently several physicians have recorded their experience with this drug, and among others Dr. Wm. Anderson, who gives a highly favorable account of it in the *Proceedings of the Medical Society of the County of Kings*.

Dr. Anderson's experience with the remedy dates back about five years, when, meeting a statement that iodine was a reliable remedy in intermittent fevers, he resolved to give it a thorough trial. He therefore prescribed it in the form of the simple tincture to a number of patients. After watching the results very carefully, he became thoroughly convinced that he had a valuable remedy, and from that time to this he has invariably, with a few exceptions, prescribed iodine in all his cases of intermittent fever, both in private and dispensary practice. He states that up to the present time he has treated at least 300 cases in this manner, and with almost invariable success. The time required to effect a cure naturally varied. In a large number there was no paroxysm after the first dose; frequently it took two or three days before any mitigation was observed. Iodine is so seldom prescribed internally that most physicians look with suspicion on the idea of substituting it for quinine, and think that the stomach would not tolerate it. Dr. Anderson says that this mistaken notion is merely the result of inexperience; he has had but one patient who could not retain it, but neither could she retain quinine. He has found that children take it readily, and in giving it to such patients he has not had a fraction of the trouble that he formerly experienced with quinine. Although he formerly used simple tincture of iodine in sirup and water with good effect, he has recently found it advisable to add iodide of potassium to the mixture to prevent precipitation of the iodine. For adults he prescribes 12 to 15 minims of this compound tincture, freely diluted, to be taken three times a day after meals, and regardless of fever. For children, 5 to 10 minims usually suffice. The author's favorite prescription in private practice is: Tincture of iodine comp., 6 drachms; sirup of acacia, 18 drachms. Mix. Dose: teaspoonful in wineglassful of water three times a day, after food. Dr. Anderson states that he has never as yet observed any injurious effects from the internal exhibition of iodine, especially the symptoms designated as "iodism."

Why this drug should act so beneficially must remain an open question till we know more about the disease itself. It is worthy of note, however, that the remedies usually employed in malarial troubles have marked antiseptic proper-



PROPOSED NEW ARCTIC EXPEDITION.—COMMANDER CHEYNE'S PLAN FOR REACHING THE NORTH POLE.

ties, and this is a prominent trait of iodine. To the American physician, indeed to the inhabitants of all countries cursed by malarial fevers, this is a subject of unusual importance. It would be a national blessing to have an effective, safe, and cheap substitute for quinine; for, although the government has recently removed its protection from the latter, this action will affect not so much the pocket of the patient as that of the apothecary.

THREE RULES FOR ABBREVIATING MULTIPLICATION.*

(From the "Talkhys Amali al Hissab.")

The "Talkhys Amali al Hissab" ("Analytical Résumé of Calculating Processes"), written by Ibm al Banna, of Morocco, contains, in the chapter devoted to the multiplication of integral numbers, some abbreviated methods by means of which, in certain particular cases, the product of the multiplication of two integral numbers may be obtained very quickly. As these processes deserve to be known, and are not found in any arithmetical treatise (although the "Talkhys" gave them nearly six centuries ago), we publish them for the benefit of our readers.

FIRST RULE.—Suppose it be required to multiply by itself a number composed of figures, each equal to unity; for example, 11,111 × 11,111.

We say that the product will be, 123,454,321.

To obtain this we write the number of figures contained in one of the factors, and to the left and right of this number we place symmetrically the natural decreasing series of numbers less than it. Thus, in the example proposed we write down 5, that being the number of figures in one of the factors, and then we place on each side of that number the natural decreasing series of figures less than 5, that is, 4, 3, 2, 1, in the following form, 1234 5 4321.

Another Example.—Multiply 1,111,111 by 1,111,111. The product will be at once obtained by writing to the left and right of 7 (the number of figures contained in either of the two factors) the numbers 6, 5, 4, 3, 2, 1, as follows: 1,234,567,654,321. If we multiply 11 by 11, the application of the same rule will give as result, 121.

SECOND RULE.—To multiply by itself a number composed of figures, each equal to 9; for example, 99,999 by 99,999. We say that the product will be, 9,999,800,001.

To obtain this result, we write down the figure 8, placing to its left as many *nines*, and to its right as many ciphers, as there are figures less one, contained in either of the two factors, afterwards adding to the extreme right of the resulting number the figure 1. Thus, then, in the proposed example (99,999 × 99,999) we write the figure 8, and to its left the figure 9 repeated four times (5—1), and to its right four zeros (5—1), giving as a result 9999 8 0000; now annexing the figure 1, we obtain the product sought, 9,999,800,001.

Another Example.—If we desired to find the product of 9 by 9, we should obtain, by applying the general rule, 81. In fact, in this case, the number of figures of either factor, diminished by 1, gives zero as a result. This explains why the figure 8 does not appear accompanied by *nines* or cipher, but only by the figure 1 of the units.

THIRD RULE.—To multiply a number composed of figures each equal to 9, by another whose figures, although equal to each other, are different from 9; for example, 999 by 666.

In this case we say the product will be equal to 665,334.

To obtain this result, we first obtain the product of a figure of the multiplicand by that of the multiplier; the figure of the units of this preliminary product will be the number of the units of the product sought. To the left of the figure of the tens of the said preliminary product we write the figure of the multiplier as many times as there are figures, less one, in either of the two factors; and to its right we place the same number of figures, each equal to the difference between a figure of the multiplicand (9) and a figure of the multiplier (6). To the extreme left of the quantity thus obtained we annex the figure of the unit of the preliminary product; thus we have the product sought. To make this clearer: in the proposed example, 999 × 666, the preliminary product will be 9 × 6 = 54; so that, to the left of the figure (5) of the tens, we place the figure of the multiplier (6) as many times, less one, as there are figures in either factor, which in this case will be twice (3—1), and to its right twice the figure 3 (the difference between 9 and 6), as follows, 66 5 33; and to complete this number we annex to its right the figure (4) of the units of the preliminary product (54). We then have the product sought, 665,334.

Another Example.—Suppose it be required to multiply 9,999,999 by 3,333,333. The preliminary product is 27, and the number of figures in each of the factors is 7; so that, writing to the left of the figure 2 (of the tens of the preliminary product) six (7—1) figures, each equal to one of those of the multiplier (3), we have, 3333332. Now, if to the right of the same figure (2) we write six figures, each equal to the difference between the figures of the two factors (9—3), we have, 333333 2 666666; and finally, we obtain the definite product by annexing to the right of the foregoing quantity the number 7 (the unit figure of the preliminary product), as follows: 33,333,326,666,667.

Another Example.—If 99 be multiplied by 22, as the preliminary product is 18, and each factor contains two figures, it will be sufficient to write, to the left of the figure of the tens (1), the figure of the multiplier (2) but once, and to its right the figure 7 but once (the latter being the difference between 9 and 2); we will thus have 217, and to this we annex the number 8 (the unit of the preliminary product), and obtain the product sought, viz., 2,178.

This rule will hold good in all cases except those in which the factors contain each but a single figure. If, for example, we should apply the rule to the case 9 × 2, the preliminary product, 18, would at the same time be the final product. It is easy to see that the second rule may be considered as a particular case of the third—one in which the difference between the figure of the multiplicand and that of the multiplier is zero.

* Translated from the *Cronica Scientifica*, of Barcelona.

ENGINEERING INVENTIONS.

An engine valve, so constructed and arranged that the pressure of the steam upon the valve from above will be nearly or quite counterbalanced by the pressure from below has been patented by Lewis H. Baker, of Fairfield, Ill.

Mr. Jean L. Nevers, of Pass Christian, Miss., has patented in this country and in England an improvement in vibrating propellers, in which reciprocating propeller blades are employed, and the improvement consists in a novel device for controlling the propeller blades. In this propeller the change of direction is always under the immediate control of the person who has charge of the steering wheel, and though the motion of the engine may not cease, the positions of the blades can readily be changed at each stroke so that they will exert no force upon the water.

Mr. James H. Gray, of Connellsville, Pa., has patented an improved device for attachment to locomotive, marine, and other engines, to operate them by compressed air. The invention consists in a series of air drums, arranged at some distance apart in the water tank of a steam engine, connected together by pipes, and communicating with suitable pumps operated by the engine, and connected by a pipe along the outside of boiler with the steam chest and cylinders.

Mr. James H. Gray, of Connellsville, Pa., has patented a direct acting pump, in which a steam or water pump and steam cylinder are operated in connection with a single piston. The invention consists in an improved construction of valves, by which a steam chest is dispensed with and the pump is rendered cheap and effective.

A switch bar, having jaws which are adjustable lengthwise of the switch bar so that they may be moved to fit the rail, and the rails and jaws shifted to the desired gauge, has been patented by Mr. William K. Dunwoody, of Eagle Mills, Mich.

Bearing Fruit.

Twenty-five years ago we went to the wedding reception of a charming and brilliant young woman from a New England State, just married to a young physician in a Western city. She had come from the best schools, and was the woman, of all others, who was looked at as a leader in the higher literary and artistic life of a prominent circle in the town. Seven years ago we again met that woman, now a matron of forty-five, in a Western university town, where her husband had finally landed as a professor of sciences in the college. We saw that the family were living in quiet and simple elegance on the small salary of a Western professor, with a house full of fine children, and no servant that we could discover.

At tea we ventured the question, "What has been the result of your studies and experience in the last twenty years? I have seen no book, or magazine article, or poem, over your name, as we expected." "I will show you my one book," she replied, leading the way to her kitchen. There she exhibited a most ingenious machine for washing the dishes of her table, which abolished the drudgery of this disagreeable end of housekeeping, and enabled a child, with the help of two "lifts" from mother, to make a play of what would be the work of a servant.

Now, of course, not every cultivated school girl has the inventive faculty to do what this woman had accomplished. But think what she has done! She has made it possible for every mother in America to save an hour a day for study, or work, in the upper side of life. She has made it not only a respectable, but an artistic employment to wash table dishes. She has made home duties and housekeeping more attractive to all her daughters, and taken one more step toward the abolition of the drudgery that has so crushed out the lives of a thousand generations of women since the days of mother Eve. We doubt if any book, even a new novel by George Eliot, or a new picture, a new voice like the warble of Gerster, or any splendid thing that may be done by a woman in America, would go so deep, touch on higher realms of life, or more justly entitle that cultivated Christian lady to the respect and admiration of the country.—*New England Journal of Education.*

Running Expenses of Narrow Gauge Railroads.

The St. Louis *Republican* gives the following estimate of the running expenses of a narrow gauge railroad, based on the performance of nineteen locomotives during the month of June last:

The locomotives consume one ton of coal per seventy miles, one pint of oil for thirty-eight miles, one pound of tallow for seventy-seven miles of running. Engine repairs have cost 4 8-10 cents; the wages of engineers, firemen, and round-house men have cost 5 9-10 cents; fuel has cost 1¼ cents; and oil, tallow, and waste have cost ¼ of a cent per mile run by the engines, making a total for engine services of 12 cents a mile; a result which is seldom equaled in the direction of economy.

Memoranda for Disinfection of Yellow Fever.

The following rules have been published by the National Board of Health:

1. It is prudent to assume that the essential cause of yellow fever is what may, for conciseness, be called a "germ," that is, something which is capable of growth and propagation outside the living human body; that this germ flourishes especially in decaying organic matter or filth, and that disinfection must have reference both to the germ and to that in or on which it flourishes.

2. Disinfection, when used in a place not infected, for the purpose of rendering filth, or foul soils, waters, etc., incapable of propagating disease germs, is a poor substitute for cleanliness, and is mainly useful to make the process of cleansing odorless and harmless. The best disinfectants for this purpose are sulphate of iron, carbolic acid, fresh quicklime, fresh charcoal powder, chloride of zinc, chloride of aluminum, and permanganate of potash.

3. The two great difficulties in destroying the vitality of the germ of yellow fever are, first, to bring the disinfecting agent into actual contact with the germ; and, second, to avoid injuring or destroying other things which should be preserved.

4. *When the germ of yellow fever is dry, or partially dried, no gaseous disinfectant can be relied on to destroy it.* It must either be moistened or subjected to a dry heat of not less than 250° F., to obtain security.

5. In disinfecting or destroying infected clothing, bedding, or movable articles, *move them as little as possible while dry.* Before disturbing them have them thoroughly moistened, either with a chemical disinfecting solution or with boiling water, in order to prevent the diffusion of dried germs in the air in the form of dust.

6. The best method of disinfecting rooms, buildings, ships, etc., is still doubtful, owing to the difficulty of destroying the vitality of dried germs.

The Board proposes to have this subject carefully investigated, and in the meantime advises thorough scrubbing and moist cleansing, to be followed by the fumes of burning sulphur, at the rate of 18 ounces per 1,000 cubic feet of space to be disinfected.

The sulphur should be broken in small pieces, burned over vessels containing water or sand, which vessels should be distributed in the closed space to be disinfected at the rate of one to each 100 square feet of area of floor.

7. No patented compound known to the Board is superior, as a disinfectant, to the agents above mentioned, and none is so cheap. Some of these patent disinfectants are good deodorants, but *the removal of an unpleasant odor is no proof that true disinfection has been accomplished.*

8. In districts where yellow fever prevailed last year the following precautionary measures should be taken:

(*a*) Textile fabrics of every description which were exposed to yellow fever infection during the year 1878, and which have remained packed or boxed in a closed space since such exposure, should not be opened or unrolled, but should either be burned or placed in boiling water for half an hour or more, or in suitable heated ovens, or disinfected, according to the nature and value of the individual article or articles.

(*b*) Every house or room in which cases of yellow fever occurred in the year 1878, and since that time have remained unoccupied, should not be opened for occupation until they have been thoroughly cleansed and disinfected, by persons acclimated to yellow fever.

(*c*) Every privy, vault, underground water cistern, dry well, or closed cellar, connected with a house in which yellow fever existed last year, and which may not have been opened since that date, should not be reopened, but if possible should be covered with several feet of earth.

(*d*) Every suspicious case of sickness should be at once isolated, and every possible precaution taken to prevent infection, by providing attendants who have had the disease, and thorough disinfection of all discharges from the sick. If the disease prove to be yellow fever, all articles of cloth ing and bedding used about the sick should be burned, the house should be vacated, and every room tightly closed and fumigated with burning sulphur.

A New Way to Treat Diphtheria.

Quite a discovery in the treatment of diphtheria has been made here. A young man, whose arm had been amputated, was attacked by diphtheria before healing took place, and instead of the matter incident to that disease being deposited in the throat, the greater portion appeared on the wounded arm, and the diphtheria was very light and easily managed. Dr. Davis, of Mankato, profited by this, and in his next case of diphtheria blistered his patient's chest, and on this blistered part the chief deposits appeared. This was also an easy case of the disease. The theory of Dr. Davis is that diphtheria usually appears in the throat because of the thinness of the lining of the throat. Hence, when the blister breaks the skin upon any other part of the body, the disease appears there.—*Minnesota letter to the Salem (Mass.) Gazette.*

American Institute Exhibition.

This exhibition opens on the 17th day of September, by which date all exhibitors should be in position. The incompleteness of all exhibitions is the cause of general and well deserved complaint, yet we hope our frequent notices may have at least the effect of having this exhibition in good shape on opening day. Any parties intending to exhibit should apply at once, and address all communications to General Superintendent, American Institute, New York city.