time to time show it to be a moderate one. The tax would enable us to begin, and every year it would prove more nearly adequate: every few years we should be enabled to take in children of a more advanced age. The *New York Times* of Jan. 13 gives a summary of the comptroller's report of the State finances for 1887. The collateral inheritance law yielded for the year $561,716.23. The comptroller says it might easily in some years produce a million, and yet under that law no lineal inheritance is taxable. The greater part of the money came from eight estates: estate of Henrietta A. Lenox, New York, $76,534.27; estate of Mary J. Morgan, New York, $64,201.64; estate of Cornelia M. Stewart, New York, $61,232.03; estate of Calvin Burr, New York, $39,711.46; estate of Hannah Enston, Kings County, $40,068.20; estate of Sarah Marrow, New York, $14,077.35; estate of Mary E. Miller, Orange County, $15,796.65; estate of B. F. Bancroft, Washington, $10,419.60. This tax, being on collateral inheritances only, reaches only a small number of successions.

I speak of the apparent absurdity of subsidizing parents to keep their children at school. Several of my friends are at the present time supporting boys in manual-training schools. These friends of mine are not doing any thing absurd, are they? No, they are doing an excellent thing for the boys. Many colleges give aid and assistance to students. To do what I propose would be only doing what the colleges have always done, and are now doing, to the best of their ability, — helping indigent students to get an education. There is nothing absurd about that, is there? Why should it be absurd to do for all what it is wise to do for the few? Besides, the education itself would immensely accelerate the acquisition of wealth, just as the small beginnings of railroad-building from the thirties to sixties helped to accelerate the increase of wealth sufficiently to give us the railroad mileage of 1888. What the world has acquired in the way of knowledge would be known to all, instead of being known only to the few: all, instead of only the few, would have access to, and would utilize, the world's stock of knowledge, and the difference this would make in the production of wealth cannot be estimated. Where there is now one millionnaire, there would be a thousand of them under the new state of things, and all the people would be in comfortable circumstances. That increase of knowledge brings increase of wealth must be clear to every one. If, instead of our present population, we had a land full of Russian Moujiks, or of people born in Spain or in Arkansas, we should not be troubled with a surplus.

The education which I propose means that no child shall go through life in the raw state; that every child shall be a finished product; and that society shall get upon every human being born the profit of the finished product, instead of such profit as there is in letting humanity go through life in the raw state, as it were.

The world is wasting its knowledge by confining it to so few. It is as if a man were to leave his family a million, and provide that only a hundredth part of it should be put out at interest to produce income. We should call such a man foolish. Well, in like manner the world is stupid in confining knowledge to the few, and depriving itself of reaping the benefit of the service of the many in their best estate. Say that a man has five children and $100,000. He can educate his children well, and leave them $80,000; or he can let them go to school till they are twelve years old, and then leave them $100,000. Can any sane person doubt which would be the better course for the children? Can any one doubt which course would be the more likely to preserve the estate? Can any one doubt which would be the more likely to increase it?

But the children whose education I advocate have not the money to enable them to be educated, and their parents have not the money wherewith to educate them. Must the rich educate the poor? I say yes; if the rich wish to live in comfort in a country governed by universal suffrage, they must do their share, and more than their share, to educate everybody. As I believe, the people who would pay the money would get a handsome return upon their investment, even those who should pay at the highest rate.

Years ago I said, and I quote it here from Prof. C. M. Woodward's recent book, 'The Manual Training School,' published by Heath & Co., —

"The alternative before you is more and better education at greater expense; or a still greater amount of money wasted on soldiers and policemen, destruction of property, and stoppage of social machinery. The money which the training would cost will be spent in any event. It would have been money in the pocket of Pittsburg if she could have caught her rioters of July, 1877, at an early period of their career, and trained them at any expense just a little beyond the point at which men are likely to burn things promiscuously. It is wiser and better and cheaper to spend our money in training good citizens than in shooting bad ones."

The first requisite is to convince the people that the thing itself is worth doing. That done, the means to accomplish it will be found. The thing proposed "is not a largess to the recipient, but a natural measure of self-defence on the part of the government which educates."

I propose it as a measure for the welfare of the community, and the welfare of the community is the supreme law.

Once established that it is the height of wisdom at all hazards and at any cost to bring the children into school and keep them there till the twentieth year, if necessary other means besides the succession-tax would be found to pay the expense. The $500 license-tax on saloons yields annually in Chicago nearly two millions. It is a new revenue never before counted upon for municipal purposes. Before we had it we got along very well without it, and we could again do so. To what better use could the license money be put than to keep the children at school? And the tax might be doubled. Double our rate, and liquor-licenses would annually yield in New York City something like ten millions. Then there is the internal revenue derived from tobacco and whiskey, yielding annually over a hundred millions, which is every day in danger of being abolished because we have no use for the revenue. This tax, unless seized upon for education, is liable at any moment to be repealed. Its appeal would be a calamity. The tax bears heavily only upon vice and crime. No useful industry is hampered by it. There is not one single good reason why it should be repealed. To what better use could the proceeds of this tax be put than to be paid out for keeping the children at school? The whiskey and tobacco tax might be doubled, and nobody be the worse for it. It is low now in order that it may not produce too much revenue. If the revenue were needed for a good purpose, the tax might well be doubled and yield over two hundred millions.

In the sense in which I speak of the settling of the labor-troubles, they would be settled if we could get along without periodically employing soldiers to use force. The graduates of the manual-training school would be just that many people taken out of the labor-problem; and, if the number so taken out was sufficient, there would be no labor-problem left.

Each individual trained to a degree to find an independent way for himself instead of relying merely upon the work of his hands to be directed by the brains of some one else, is to the extent of that individual a settling of the labor-troubles. The settling would operate as things did in Germany in the time of the first Napoleon. So long as German soldiers fired their guns at his command upon his enemies, he maintained his supremacy in Germany; but when the Germans took to shooting at him and his, instead of for him and against his enemies, there was end of Napoleon's supremacy. Sufficient training, intelligence, and efficiency would make all our people for peace, and there would therefore be peace. The lawlessly disposed would be so few and lonesome that they would cease to riot. If I may be allowed an Irish bull, the lawless could be made to shoot the other way by being made so intelligent and efficient that they would refrain altogether from shooting.

AUGUSTUS JABOBSON.

Chicago, Jan, 24.

Weather-Predictions.

IF Professor Hazen is willing to admit, as I infer from his letter in *Science* of Jan. 27, p. 49, that the Blue Hill predictions for last October give a higher per cent of success than his own when verified by the unmodified original rules he sent me, it seems to me there is an end of the matter between us. I do not deny that better methods of verification of weather-predictions are wanted. All that I have ever claimed is, that the Blue Hill predictions, when verified by the Signal Service rules, in accordance with which they

were made, give a higher percentage of success than the Signal Service predictions for this vicinity. Professor Hazen made the predictions for the Signal Service during October; and if more extended comparisons between his predictions and those of Blue Hill are of importance, why not compare the Blue Hill predictions with the similar predictions of the Signal Service, published in the same newspapers? The Blue Hill predictions were made for south-eastern New England, and I am perfectly willing that they should be verified for the States of New Hampshire, Massachusetts, and Rhode Island in accordance with the published rules of the Signal Office (see chief signal-officer's report for 1886). In making the Blue Hill weather (not temperature) predictions, the phraseology and definitions of the Signal Service have been closely followed; and, if any of the readers of *Science* care to extend the comparison, I will gladly furnish them with the past or future Blue Hill predictions as they appear in the Boston papers, since I am confident that these, when verified in accordance with the published Signal Service rules, will give a higher percentage of success than the predictions of the Signal Service. When it is considered that the Blue Hill predictions are extended for nine hours longer in advance than those of the Signal Service made from the same telegraphic reports, and that less than one-third the telegraphic data at the command of the Signal Service are available at Blue Hill, it seems clear that by improved methods and more localized predictions the efficiency of the Signal Service could be greatly improved and its expenses reduced. During January the Blue Hill predictions will average something like fifteen to twenty per cent higher than the Signal Service predictions for this locality; and this seems of interest, since I understand that Professor Hazen, who is assumed to be one of the leading predicting-officers, made the Signal Service predictions for this month. H. HELM CLAYTON.

Blue Hill Observatory, Jan. 30.

Hybrid Diseases.

IN a paper presented at the recent meeting of the American Public Health Association (*Science*, x. 289), Dr. E. M. Hunt of the New Jersey Board of Health brings out some original ideas about disease-germs, that are likely to prove misleading to persons whose knowledge of the subject is derived from the public press. The etiology of so many zymotic diseases is now under investigation by experts in bacteriology, that the general reader or practitioner who is not an investigator is severely taxed to keep track of the often conflicting and incomplete results; and an especial effort should be made to avoid unnecessary complication of the subject by the introduction of theories not based on a correct understanding of what is known or extremely probable.

Excluding the protozoan claimed by Laveran and others as the cause of malarial fever, the moulds that occur in connection with certain local diseases of the ear, etc., and the *Actinomyces* of man and some other mammals, the active agents of common parasitic diseases that are at all credited are bacteria. One of the systems of classification now generally used recognizes four main divisions of lower plants below mosses and liverworts, — thallophytes, zygophytes, oophytes, and carpophytes, — beginning with the lowest. Bacteria fall by common consent into the first and lowest of these groups, — the protophytes. This group is a sort of *omnium gatherum* for many things that cannot be placed elsewhere, and is chiefly known by negative characters, the absence of much evident structural differentiation, and of any form of sexual reproduction, heading the list. This being the case, it would partake of dogmatism to make any very emphatic assertions about the plants that now find lodgement in it; yet it may fairly be said that no theory that rests upon the assumption of sexual processes in any of the protophytes is tenable. Hybridity is usually the result of sexual union between representatives of two more or less nearly related species, and in this sense is not only not known among plants of this group, but very improbable, since they have thus far given the best investigators no indication of even the simplest form of sexual union, — conjugation. The only other mode of hybridizing, if it really be such, corresponding to the formation of 'graft-hybrids' among flowering plants, could come only from the fusion of individuals of two species, and would amount to conjugation. It seems to me, therefore, that such a theory of hybrid diseases as Dr. Hunt has propounded is entirely untenable, and a very unfortunate addition to a literature already overcrowded with notions that others must eliminate.

I fear that my friend Mr. Meehan wrote his opinion on lichens rather hastily, and perhaps without intending to have it given to the readers of *Science*, or he would scarcely have expressed the belief "that all lichens are hybrids between fungi and algæ." Botanists do not agree on the lichen question, any more than physicians do on the germ-theory of disease; but neither the followers of Schwendener, nor the old school, would be likely to advocate the hybridity that Mr. Meehan believes to be conceded. The relationship of the two parts of a lichen, according to the Schwendener school, is merely that of association, either parasitic or symbiotic, and in no sense comparable to hybridization, while the advocates of lichen autonomy hold them for parts of one and the same individual.

Realizing fully the advisability of excluding dogmatism from the discussion of all that pertains to sanitation, I have written this correction in no *ex cathedra* spirit, and I trust that it will not appear to either Dr. Hunt or Mr. Meehan as any thing more than an effort to check the entrance of error into the discussion of one of the most important subjects that is prominently before the public.

WILLIAM TRELEASE.

St. Louis, Mo., Jan. 28.

Color-Blindness.

REFERRING to your comment in *Science* of Jan. 27, I would say that I have always believed that the defect of color-blindness could be accurately described only by one who, like myself, is subject to the peculiarity. From an early age I have been aware of the trouble, and by my attempts to assign names to colors have often furnished my friends much amusement. I have made many efforts to correct the defect, and am convinced that any attempts to educate the color-sense will result in no benefit to those who are really color-blind.

There are two sets of colors which in my mind will always be hopelessly confused. The greens, browns, and reds comprise the first; and the blues, pinks, and purples, the second. None of these colors seem to me absolutely alike. The contrast, however, is not striking, and I should describe each of the three as different shades of the same color.

Being near-sighted, I could not at a distance distinguish the blossoms from the leaves of a bed of scarlet geraniums. On approaching, however, I could readily detect the difference, but should describe the flowers as darker than the leaves, though to my eyes somewhat similar in color. While riding through the fields of France, members of our party frequently exclaimed at the multitude of scarlet poppies in the grass. Though I looked with longing eyes, not a poppy did I see during the entire journey. Similarly I am unable to detect cherries upon the trees, or strawberries on their vines, unless quite near to them. Notwithstanding this confusion of green, red, and also of brown, I can, by the worsted test, detect a difference in all the shades of these three colors. If I attempted to assign names to the various hues, it would of course be mere guess-work. The neutral tints of a November landscape, too, possess great beauty for me. The green of the grass, the browns of the leafless trees or of the soils in adjoining fields, the sombre hues of the sky, are all pleasing to my eye. Such being the case, the term 'color-blindness' seems altogether a misnomer.

The second set of colors I should describe as follows: pinks, blues, and purples are closely allied; I should call them all blue. Pink seems a lighter, and purple a darker, shade of the same hue. But, as in the case of the first set, all variations of these three colors are readily manifest to my eye.

It may seem too strange to be true, but I have frequently arranged flowers into bouquets which have been perfectly satisfactory to those who are not color-blind. I have, of course, no means of determining whether a brilliant sunset is more charming to others than to myself. I fancy that my defect deprives me of very little of its beauty.

Although in the rainbow I can distinguish only the red, yellow, and blue, it is probably as attractive to me as to others. I have as