

LETTERS TO THE EDITOR.

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Weeping Forms of Trees.

IN NATURE for July 11, on "Weeping Forms of Elm," Mr. W. H. Shrubsole refers to two distinct factors: (1) the "weeping" of the shoots, and (2) the peculiar contorted appearance of the older branch-systems. A fine specimen of the weeping ash, grafted, as usual, standard high on a common ash stock, in the Oxford Botanic Garden, shows a clear "umbrella" of weeping branches, while the head of the tree is a similarly twisted and contorted mass of large boughs.

The weeping effect is due to weak geotropic sensitivity, but to a greater extent to congenital enfeebled response to the action of light. The weeping shoots on bending branches grow out in the direction impressed on them in the bud, without any attempt at correction, and thus pass out and down, almost vertically, as sub-etiolated shoots with very long internodes (a foot or more), the shoot of the current year being as much as 6 ft. long. It is obvious that they cannot go on for ever, as they soon touch the ground, while they receive the less illumination as they pass down from the crown of the tree.

But not all the branches are of this type, as in other freak-forms the normal type of strongly positively heliotropic shoot with erect habit and short internodes (6 in.) is still freely produced. Since these get into the more illuminated regions they progress, after all, better than the others; and as they twist round on the drooping branches to straighten up, the surviving branches of the tree ultimately consist only of such "contorted" shoots, and the central trunk-system takes on the peculiarly twisted mass of boughs.

The effect is, however, only an exaggerated expression of the same causes which produce the erecting curvatures in a tree formed of branch-systems bending down under the weight of their foliage; and all weeping trees tend to show it more or less, the weeping ash, with decussate foliage and long annual shoots, perhaps most clearly. To make a more shapely "umbrella," the non-weeping shoots may be cut out, but the tree continues the space-form by "natural causes." A. H. CHURCH.

Botanical Laboratory, Oxford, July 15.

The Mineral Wealth of Germany.

IN NATURE of July 4 Prof. Louis criticises my paper, "Germany's Natural Wealth," which appeared in the *Fortnightly Review* of June. In that paper I pointed out that the wealth of Germany in coal, iron-ore, and potash amounts to at least 240,000,000,000l., taking the value of coal and of potash at 10s. per ton and that of iron-ore at 5s. per ton. Prof. Louis, on the other hand, tries to show that the value of Germany's three principal minerals comes only to 700,000,000l., and asserts that I have overstated Germany's mineral wealth more than three hundred times.

With all respect to the scientific eminence of Prof. Louis, I am afraid that he has made a great mistake. The value of a nation's natural resources can be estimated either from the point of view of the capitalist, who wishes to exploit mines, etc., for his personal profit, or from that of the nation as a whole.

A nation has two characteristics. In the first place, it must be considered practically immortal. In the second place, it consists not merely of a few capitalists, but of the whole population. From the point of view of the company promoter, the capitalist, or the shareholder the value of a ton of coal *in situ* is, of course, not 10s., but only a few pence which form the capitalist's margin of profit; provided the coal be immediately available, and merely a small fraction of a penny if it be available fifty years hence. Every child knows that. On the other hand, from the point of view of an undying nation the value of a ton of coal *in situ* is, of course, 10s., or whatever is a fair average price at the pit's mouth; for although 9s. 6d. may be required in wages and expenses to extract that ton of coal, this 9s. 6d. goes to the nation. Therefore a ton of commercially exploitable coal *in situ* is worth 10s. from the national point of view, whether it will be extracted in the present year or a century hence. The same reasoning applies, of course, to iron-ore and potash.

My article dealt exclusively with Germany's national wealth from the national point of view. I did not even mention the profit of capital, which is a minor consideration. While Prof. Louis's estimate capitalises and sums up the immediate value of the profits of capital, my estimate of the value of Germany's mineral resources is taken from the point of view of the nation. Of course, it is absolutely non-permissible to say, as Prof. Louis does, that the value of a ton of coal is 6d. because that is the capitalist's profit. If coal-mining in Great Britain would return only sufficient to pay expenses, cost of management, etc., the British coalfields, the basis of the country's wealth, would, according to Prof. Louis, be worth exactly nothing, while by my calculation they would be worth 100,000,000,000l.

In view of the probable increase in the price of coal, iron-ore, and potash in the future, my estimate of the value of Germany's minerals was probably a great understatement. POLITICUS.

July 6.

THE above comments of "Politikus" are marred by two notable fallacies. In the first place, he holds that my valuation of the minerals is based upon the profit to be derived from mining them. This is quite wrong; my valuation of the coal, etc., *in situ* is based upon the only true criterion of value, namely, the price which it will fetch in the ordinary open market, the sum which those who wish to mine the coal are prepared to pay for that coal in its unsevered condition, *i.e.* in this country the average royalty which the coalowner can get for it. The profit which those who mine it can make out of it has nothing whatever to do with the valuation, except indirectly, in the sense that coal which cannot be mined at a profit is unsaleable, and therefore has no value. The other fallacy is, perhaps, best shown by pointing out that, according to "Politikus," the unsevered coal in the bowels of the earth is worth as much as the same coal at bank, so that in his view the nation gets the labour and materials expended on raising the coal for nothing! It is surely obvious that if coal at bank, after 9s. 6d. per ton has been spent upon getting it, is worth 10s. per ton, it cannot be worth 10s. before anything has been spent upon it, and that this is equally true whether such expenditure be looked upon as national or as individual.

The further contention that money realisable in fifty years is worth as much as money realisable to-day is surely not worth discussion; nations as well as individuals have to pay interest on their loans. According to "Politikus," the 15s. 6d. war savings