

day, when the report of Captain Tyler and Eborall, together with the other business, may be fully considered.

On behalf of the Board,
EDWARD W. WATKIN,
President.

Grand Trunk Railway Offices,
21 Old Broad-street, October 9, 1867
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THE SUGGESTED INTRODUCTION OF THE PRUSSIAN RENT BANKS INTO IRELAND.

(From the London Economist, Oct. 5.)

MR. Henry Dix Hutton, who is well known to have given much thought and labour to the Irish land question, read a very interesting paper at the late Social Congress upon the Prussian Rent Banks, the principle of which he thought might be usefully introduced into Ireland. The same suggestion has often been made before, though less thoughtfully and coherently; and Mr. Hutton's paper will have a permanent value as the most careful description in English of a very remarkable agricultural experiment. But we cannot agree with him that the Prussian Rent Banks are at all models for English imitation. We leave out for the present the vexed questions, whether the English State ought to help the creation of peasant properties in Ireland; and, if so, to advance money for that purpose. Our present point is, that even if such aid is to be given, and such money advanced, this is a bad way of doing it. The Prussian Rent Banks seem to us a rudimentary and infantine financial device, rather than a model of imitation to a Government of first-rate credit. Mr. H. D. Hutton very clearly explains that the agricultural problem solved by Stein and Hardenberg, in Germany, is altogether different from any which we have to solve in Ireland. At the beginning of this century Prussia, like many other parts of the Continent, was still under a semi-feudal system of agriculture. The peasants had "rights" more or less fixed in the land, and the nobles other rights more or less fixed. Much of the country resembled, in fact, our copyhold manors only that the law was less certainly defined, and that the holders at the customary tenure were peasant cultivators. What Stein and Hardenberg, in fact, did, was to "enfranchise," as we should say, these copyholds, and to make the peasants real proprietors. They bought out the "manorial lord," and gave the whole ownership to the cultivator. The difference between the old state of Prussia and the present state of Ireland is, therefore, obvious. In Prussia, the peasantry had never been "divided from the land;" they had always possessed great, though vague, rights in the land; they had for ages been educated by the "sensation" of property; their whole habits had been formed by it; whereas, as we all know, in Ireland the great difficulty is, that the peasantry have had no such culture; that they have been long "divided from the land;" that, according to antecedent likelihood, they are as ill fitted to become at once by sudden enactment peasant proprietors, as the Prussian peasants were well fitted. But Mr. H. D. Hutton imagines that, though the general scope of the Prussian land measures and the Irish must be different, yet that, in essence, the financial part of Stein's plan will do in Ireland as well as elsewhere.

Of course, in creating a peasant proprietary out of customary occupants, Stein had to conquer the primitive difficulty—the peasant cultivators had no money with which to buy out the manorial lord, and, therefore, the State had to aid them. No national treasury has ever had enough ready money for such a purpose, and least of all, the Prussian Treasury of 1811. It was necessary to use the State credit, and he, therefore, established what are called rent banks abroad, though an Englishman finds the expression very confusing. These "banks" had nothing in common with such banks as ours; they received no deposits; they had no concern with other people's money in any form; they had no shareholders. They were simply a Government department charged with this peculiar financial operation. The natural idea of every modern Government when it wants to buy anything and has no real money—no metallic money to buy it in—is to give a bit of paper for it. The Prussian Government did so; they valued the interest of the "lord" at such and such a sum, and issued to him bonds with 4 per cent. interest. These bonds were in every sort of sum from 30s to £150—and were payable at the option of the Government, but not at the holder's option. The landlord was compelled to take them, and the idea of issuing them in various sums was that he might keep them or pay them away—in every mode that he thought fit. These bonds were secured on the estate, and the tenants were obliged to pay a certain rent charge annually for their liquidation. There was an annual "drawing," according to the continental fashion, and the bonds "then drawn" were discharged out of the sums so paid by the peasants. And, of course, if the peasants did not pay their annual *quota*, the State took and used very simple powers of entry and confiscation.

When divested of technicalities, and looked at as a matter of business, every Englishman sees at a glance that though possibly Stein had no better financial resources in Prussia in 1811, such a plan as his would be

a barbarous piece of finance for us to adopt now. Mr. H. D. Hutton himself suggests this. He says, "The State alone possessed the means of circulating paper money at a low rate of interest." But he should have remembered that these bonds, though often issued in small sums, are, according to his own description, not payable at the option of the holder, and were, therefore, inconvertible; and to the issue of a compulsory and inconvertible currency, there are great and obvious objections. It deranges prices, displaces gold and silver, substitutes a bad and fluctuating measure of value for a good and stable one, and brings in all the elements of confusion from which the Americans are now suffering. If these bonds had been—as Mr. Hutton thinks they were, and as probably, the Prussian issuers thought they were—suitable for money, they would have produced the greatest evils.

But, in fact, no interest-bearing security is really suitable for currency purposes, because its value changes from day to day. The interest accrues, as the lawyers say, *de die in diem*; it is one thing on the 1st October, and a greater on the 2nd October; a sum, therefore, has to be done whenever the bond changes hands, and no population will ever bear, or has ever borne, a kind of currency requiring so much labour. But, unsuitable as these bonds were for currency, they were equally unfit for good borrowing. A State, when it wants money, should try to get its money as cheaply as it can. But, if offered in the market "bonds payable at its option, but not at the holder's option," it would borrow very unfavourably. Every holder would say, "This security can never go to a premium, for if it did, the State would pay it off. It is quite sure, therefore, that I cannot gain a profit by taking it. Nor can I be sure of any fixed revenue; the rate of interest, no doubt, is fixed on the bond, but, if the market rate goes down below the printed rate, the Government may pay me off, and will. And though I can gain no profit, and though I am sure of no fixed income, I may yet lose considerably—since, if the printed rate of interest on my bond is less than the market (and in time of war or panic it may be much less) my security will be at a heavy discount." Such bonds as these, therefore, are the very sort of security which an instructed money market would dislike, and, therefore, the most unprofitable and wasteful form in which a government could contract a voluntary loan.

The Prussian Government doubtless, did not suffer these evils, because theirs was an involuntary loan. They made the lord take these bonds; threw the disadvantage of the inconvenient security upon the person whom they compelled to take it, at the rate they fixed themselves. This may or may not have been wise or necessary in Prussia at that time; perhaps it was, on the whole the best plan, for Stein and Hardenberg were men most competent to choose; but it is plainly a severe act of despotism; and it would be outrageous in a wealthy Government like the English, to compel any of its subjects to take a form of security so unpalatable and objectionable as to be unfit for optional borrowing.

Probably, indeed, most people will be surprised to hear it suggested, that in finance England should go to school to Germany. Prussia may have much to teach us in other departments; but, surely money is our own subject; we understand that if we understand anything. And so it is. If we should ever decide to buy out the Irish landowners or any of them, we must borrow the money as we ordinarily borrow it. We have had experience enough to know the best way, and probably Stein would have been most glad to borrow in Consols, if so good and economical a security had sixty years ago been at his disposal.

ALUMINIUM BRONZE.

THE *American Journal of Mining* says:—Of all the alloys which aluminium may be made to form with other metals, none promise to be more useful or beautiful in their application to the arts, than the various combinations of aluminium and copper, called by the general name of the aluminium bronze. The alloy containing ninety per cent of copper and ten per cent of aluminium is especially adapted to a great number of applications; since it possesses a number of useful properties which are seldom united in one substance. Among these properties are hardness, malleability, tenacity, homogeneous structure, elasticity and resistance to organic acids, including the acids of fruit and fatty animal matter. It is well known that alloys often present characteristics totally opposed to those of their constituent metals. Before the discovery of steel, for instance, tools of great hardness were produced by mixing copper with tin and other metals. The ancient Peruvians attained a high degree of civilization, surpassing that which is commonly ascribed to the Age of Bronze, by the use of some such composition. It is true, that some of the processes by which the ancient alloys were prepared and hardened, are lost to mankind; but the fact remains, and is sufficiently illustrated by our modern experience, and is sufficiently strikingly exemplified than in the instance before us. Copper is soft, inelastic and easily oxidized; aluminium, although remarkable for its resistance to chemical action, is, in other ways, unsuited to mechanical uses; but the ten per cent bronze is more tenacious than cast steel, more elastic than brass or gun-metal, and less liable to oxidize than silver. It tarnishes very slightly by exposure, but is at once restored to its lustre by simple friction. Its color is almost that of eighteen carat gold used by jewelers. It may be gilt and soldered without difficulty; it may be cast and forged as well as iron. Its specific gravity is nearly that of iron, averaging 7.7. It has been used already for a great variety of purposes, and new applications are being rapidly introduced. Its brilliant color and lustre naturally adapt it to the manufacture of ornaments and jewelry. In England and Europe, the works, cases, and chains of watches, snuff-boxes, harness-

trimmings, door-knobs, window-fastenings, lamps, candlesticks, statuettes, vases, journals and pinions for machinery, pistol and gun-barrels, cannon, and many other objects, hitherto made of brass, ordinary bronze, or gold and silver, have been successfully manufactured from this material. In the French Post-office Department, it is said, plates of aluminium bronze have been substituted for the old perforated steel plates, used in the machinery for puncturing postage stamps, and have been found far more durable. One application which we have not mentioned, appears to us most desirable. No one who has ever broken a brass key in vain attempts to move the rusty bolt of an obstinate lock—and who has not experienced this vexatious accident?—will deny that a key and lock which are as strong as steel, but do not rust, add much to the comfort of mankind. We have an awe-inspiring front door at home; and we never insert our night-key into its ponderous lock without secret fear of being left with the useless half in our nerveless grasp, and the pleasant alternative of jingling the bell in the basement until it wake the sleepers in the upper stories. We think that aluminium bronze would also be an excellent material for coin, if it were not too much like gold.

This new alloy—we might also say new metal, since it is far more homogeneous and intimate a combination than most alloys—is only manufactured at present, we believe, in France. A house in Maiden Lane is engaged in the importation of wares, manufactured from it; but confines itself to articles of table service—tea and coffee-pots, knives, forks, spoons, napkin rings, etc. These are sold here at prices not exceeding those of the best silver-plated ware. We confess that we scarcely expect to see them take the place of silver. Although they are not put forward as imitations of gold, they have an unfortunate resemblance to that metal; and few persons would care to use real gold for such purposes, while fewer still would like to be suspected of pretending to do so. Yet the great durability of the new wares—there being nothing like a plated surface to wear off—and the ease with which they can be polished and kept clean, may, in time, insure their general use. The possible mechanical applications seem to us far more important; and we hope to see them increase in frequency and variety.

The great desideratum now, is a cheap process for the manufacturing of aluminium. It is strange that this metal, constituting so large a portion of rocks and clay, and distributed over the whole earth more abundantly than any other, should be so difficult and costly of manufacture. We hear talk, already, of producing it in this country; but we cannot feel sure that, in the present expensive way, whether by means of the artificial chloride, or the natural fluoride, as found in the crystals of Greenland, the manufacture of aluminium in this country could compete with that of France; and, above all, unless the price of the metal can be reduced, its use for a thousand purposes to which it is admirably adapted, will be, for the present, out of the question.

THE QUESTION OF FUEL FOR THE PACIFIC RAILROAD SOLVED.

IN the *Times* of Sept. 19, a correspondent, writing from the Pacific coast, after noticing the crossing of the Sierra Nevada Mountains by the Pacific Railroad, mentions some of the real difficulties that stand in the way of that magnificent enterprise, among which is the entire absence of fuel between the Sierras and Salt Lake, a distance of five hundred or seven hundred miles. Not a tree of timber or piece of firewood can be obtained. "The question of questions," the writer says, "for the Pacific Road is—Can coal be found near the track? With good anthracite coal discovered anywhere convenient to their line, they have solved the problem of fuel supply. With coal even two hundred and fifty miles away they can even the question of fuel." Your correspondent happens to be aware of the fact that the Board or Directors of the Pacific Railroad in California have reviewed the use of oil as a fuel for locomotives, to be used on the principle applied by Col. Henry B. Foote on board the United States gunboat *Falco*, and in one of the Boston steam fire-engines. The recent experiments here by the inventor of an apparatus for employing petroleum and other hydro-carbon oils as a fuel, has settled the question of fuel for use in long stretches of country where there is no wood nor coal. The apparatus in question can be adapted to a locomotive as well as to a steam fire-engine, and the tender of a locomotive can carry a sufficient supply for five hundred to one thousand miles. The enormous saving which this method will make in running locomotives is also a consideration of great importance. It is calculated that an "iron horse" uses about seven hundred pounds of coal per hour, or four tons a day of twelve hours. By the use of petroleum a locomotive can be run the same length of time for \$50. Two barrels of oil will do the work of one ton of coal. The new Pacific Railroad, when completed, will require fuel trains in constant operation from long distances, to keep the wood and coal stations supplied; while with Col. Foote's apparatus all this can be obviated, besides gaining many other advantages. The fact that the Pacific steamer are going to use this invention, at an estimated saving of nearly \$6,000,000 annually, in the use of fuel, is only a fore-runner of that great revolution which promises to take place in the use of fuel in marine and locomotive boilers. With the building of the Pacific Railroad, and the scarcity of fuel along the line of the road in the fearful wilderness and desert between the Sierras and Salt Lake, the invention of Col. Foote would seem almost providential. The recipients of the best franchise ever granted by our Government will not be slow to take advantage of this invention, and thus solve the problem as to the supply of fuel.—Boston correspondence of *New York Times*.