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(Illustrated articles are marked with an asterisk.)

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Detailed table of contents for the Scientific American Supplement, No. 84, listing sections like Engineering and Mechanics, Electricity, Light, Heat, etc., and various technical articles.

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THE DEGRADATION OF LABOR.

Labor is honorable, and the laborer worthy of honor in direct proportion to the personal integrity, independence and capacity that go with it. Abject servitude, even when voluntary, is neither honorable to the individual nor profitable to the mass.

This is the American idea: it is the independent laborer that honors labor. Unhappily of late years the majority of our working men have forgotten or failed to learn this basic principle of our social, industrial, and political system. Worse: they have hearkened to demagogues who have taught them contrary doctrines—doctrines subversive of all true manliness in working men, and calculated only to degrade labor by reducing the laborer to practical slavery.

Could there be a bitterer, satire on the manliness of working men than the mainplank in the platform of the "bread winner's league"—bread beggar's league, more properly—to the effect that the government—in other words their fellow citizens—should furnish them with employment and wages? Is government servitude the highest aim of the present generation of working men?

Time was when the American laboring man's boast was that he was, or was bound to be, his own master, asking odds of no one. He felt himself a free man, capable of self-support; a man whose strength and skill need not go a-begging for employment. While this was the rule labor could not be redundant. The laborer was not abjectly dependent on some one to hire him, for he was able and willing to work for himself. However limited the scope of his productive industry, he was, or could be an independent producer; and his work was to be sought for if it was to be hired.

But all this, it would seem, has been changed. As a rule the laborer—tradesman, mechanic, artisan, or what not—is not and no longer aims to be first of all a free man. On the contrary he desires nothing and looks forward to nothing but to be dependent on some one for a job. He must be hired, or he can do nothing; and such employment failing he falls back, not on his own capacity for self support, not upon independent industry, but to the vain demand that government shall make work for him. Then having made himself utterly dependent on wages, he foolishly imagines that he can overturn the fundamental laws of work and wages, and dictate the terms at which he will be employed and the kind of work he will do.

The first lesson that the working men of the country need to learn is that they have no claim upon any one—individual, corporation, or government—for employment. They are not infants, but men: and they must be willing to act a man's part in the great industrial struggle, or go to the wall. Inability to find a master is no excuse for idleness; nor more is any lack of demand for the specific labor they prefer to do. The manliness of the working man is gone, the prosperity of the working class vanishes, the moment men give themselves up to individual helplessness—the first fruit of the fallacy that other men are in duty bound to provide them with the means of making a living. No part of the community, neither "capital" nor government, is in any way bound to furnish work for any one. And it matters little whether men demand or beg that employment be given them as their only resource against starvation, they ask only what would but seal their moral and industrial degradation. To persist in huddling together in increasing helplessness, is simply to rivet the chains of the slavery the working classes are doing most to bind upon their own limbs. The laws of Nature cannot be reversed to relieve men of the consequences of their folly.

Not until the old spirit of manly self respect and individual self-helpfulness is revived; not until the majority of the industrial classes seek first to become, sooner or later, their own employers, will prosperity return to them. Until then the labor market will be glutted; by their very numbers the mob of employment seekers will destroy the chances of all for steady employment; and by their hungry competition with each other they will dissipate the only hope of any for remunerative wages. It is not any absolute redundancy of laborers as much as the misdirection of their efforts that makes or largely helps to make the times so hard for laboring men.

IRON AND STEEL IN RAILWAY CAR CONSTRUCTION.

At the annual meeting of the Master Car Builders' Association, held in New York city, June, 1876, a committee was appointed to whom was referred the subject of iron and steel in railway car construction. The report of this committee, given in the late meeting in Cleveland, Ohio, was that the substitution of steel for iron in car construction was a subject of first-class importance, and merits more attention than it had yet received.

In answer to the question of iron or steel rods in car bodies, the majority preferred iron, but it must be iron of 60,000 pounds textile strength to the square inch. Open hearth steel was admitted to be tougher and denser, but was too expensive. It was thought that steel could be produced, that with less size and weight would give equal strength. Of bolts, all preferred iron, though none seemed to have tried steel bolts. Charcoal iron was specified in the report, and the suggestion was made that good iron was better than poor steel. Of steel nails, the majority admitted to not have used them, while in one instance they were preferred because they were lighter, and as cheap as iron. Another member had received some samples with request to try them, and he reports that he had no difficulty in driving every steel nail

to the head, while he found it impossible to drive a cut nail more than half way before it would break.

In order to further test the economy of steel nails, the returning board gave the following table of the weight of iron and steel nails as one of the results of their labor:

Table comparing the weight of iron nails (260 to 1 lb.) and steel nails (208 to 1 lb.) in various sizes (6d., 8d., 10d., 12d., 20d., 40d.).

The price of these nails was quoted as 50 cents per keg more than iron.

Steel screws were admitted by one or two persons to be fifty per cent stronger than iron, yet the majority preferred iron. Another recommendation of the steel screw was that there were no imperfect ones found; yet this must be admitted to be a recommendation for the manufacturer of said screws. The roughness of annealed steel screws was complained of, as well as their tendency to twist. It was admitted that where iron screw heads touched iron, they were better in that condition than steel screws.

It was thought that the carlines of passenger cars, if made of steel, would be more rigid than iron. It was suggested that body bolsters, if made of steel, would be lighter, and in the end might be as cheap as iron. It was thought that a sudden shock would be liable to break the steel bolster, yet the experiment had not been tried.

Of axles, the majority preferred steel, and open hearth steel was recommended as being more likely to be free from cracks. Some claimed that iron axles run with the coolest journals, while others advocated for steel the same advantage. It was admitted that the low price of iron axles hindered making them as good as they should be. The recommendation for the steel axle was that it could be lighter, and its stiffness prevented crystallization. Steel axles do not bend as iron, though they showed in some instances a tendency to crack in the inside of the wheel hub. Lubrication was more perfect upon steel surfaces than upon iron, and they worked with a much finer surface than iron axles, and would wear longer. One member had commenced a series of microscopic experiments to get at the cause of the iron axles heating, and found that the fibres of the iron stuck up, as he said, like knife blades.

The majority preferred cast iron wheels, though steel was thought to be safer. One fault of the steel wheel was that it would split in the tread. Brake shoes of steel showed less percentage of loss by wear than the iron, and no percentage of difference was found in the wheel to which they were applied. Upon a car that had run nearly ten thousand nine hundred miles, the wrought iron shoes weighed, when applied, thirty-four and a quarter pounds; when removed, weighed thirty one and a quarter. A pair of steel shoes weighed thirty pounds, and when removed weighed twenty-eight and a half pounds, having lost one half pound. Showing one and a half pound of loss in favor of steel.

A conservative character appeared in the reports upon the distinctive merits of steel over iron, and the majority did not seem inclined to make a change from iron to steel, unless convinced that decided advantages were to be gained. Indications seem to show that, with them, steel and strength were not synonymous.

ABOUT SPARROWS.

Any European conversant with the habits and color of the sparrow in his original home on the other side of the water, and who closely watches the sparrows in and around New York city, cannot fail to observe that the latter are undergoing a change of habit as well as color. Probably no part of England, if even of Europe, is more infested with this impertinent little fellow than is the county of Kent where the barnyards and fields abound with them. It is, however, necessary to draw a distinction, for there are two kinds of sparrows, the house sparrow and hedge sparrow. The former builds a ragged, clumsy-looking nest, notable for its size and external looseness; even the feathers with which it is lined are placed in no kind of order, but appear to be put together in a spirit of "that is good enough for me." The eggs are a dull white color, speckled with reddish brown spots, and number from four to six; rarely less than the former, and never exceeding the latter. The house sparrows rarely gather in large flocks, or indeed flock at all, save in winter. They build their nests in colonies if the conditions are favorable, otherwise they will build in nooks about cornices, under waterspouts, and sometimes in trees. Over the main entrance door to Trinity church in New York city are several house sparrow nests built in the ornamental stonework. In the ornamental cornice work of many brown stone front residences the same will be observed. The hedge sparrow is similar in appearance to his confrere save that he is a trifle smaller. He is much more tidy, however, in his household affairs. He builds a snug little nest, neat and compact outside, and carefully lined, with horsehair and feathers inside, made round and with a full open top. The fibers of which it is mainly composed neatly interwoven, and it is as cosy withal as a linnet's nest. They build separately and usually in small hedgerows, leaving the holes in trees and similar places to their city brethren, the house sparrows. They lay five small eggs of a beautifully clear blue color. The hedge sparrow it is against which the European farmer wages relentless warfare in the grain and seed fields; while the house sparrow is attacked in the barn-