

Scientific American.

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Work for the Unemployed.

For several weeks past a sad spectacle has been witnessed in New York and other large cities—the spectacle of thousands of mechanics and working men parading the streets and assembling in the parks, out of employment, and destitute of the means of providing for themselves and their families. The recent financial crisis, which fell upon us so suddenly, has been very disastrous in its results to the industry of our country. Manufactures have been paralyzed, and no one but an eye-witness can have a conception of their complete and overwhelming prostration. We have visited some manufacturing districts, where the cheerful sounds of busy industry used to be heard in every street “from early morn till dewy eve;” now all is sad, dreary and deserted. Factories are closed, forge fires are extinguished; the hammer, the saw, the spindle and loom, are silent; and men walk about the streets with anxious, care-worn countenances, for although they have willing hearts and ready hands, there is no work for them to do; and want stares them in the face, especially as the winter is at hand, and they had entirely depended on their daily toil for their daily bread. In our largest cities these evils are more concentrated, assume the worst phases, and attain to the greatest magnitude. This has been especially felt to be the case in this city—New York—where the number of unemployed persons is greater at present than at any other period of its history. Last week, multitudes of them held meetings, at some of which violent speeches were made, and threats uttered in reference to plundering the United States Sub-Treasury in Wall street, which contains many millions in specie. These threatening exhibitions were not the expression of the mass of our unemployed people (who are peaceably disposed, and more ready to protect than attack the property of others), but the expression of some fanatics, probably, incited by evil-disposed persons, such as thieves and burglars, who, in cases of such mobs, always contrive to secure the largest share of plunder, and adroitly evade detection.

Some anxiety was felt, as to the security of property, and a call was made for the United States' soldiers for protection; but such feelings were more fanciful than sensible. The police force of our city, properly organized and handled, is perfectly capable of protecting the property of our citizens against the most violent mobs. The workingmen who are idle only want work; and, as the experience of all countries proves that times of public depression in business are prolific with crimes, the best way to provide against such is to find employment for the idle. Our city government has wisely directed its policy to secure this end, in a measure, by voting a large sum for their immediate employment on the grounds in the Central Park.

The city government is not bound by any political right to find employment for those who are out of work; but as it is the moral duty of government to provide for the poor, surely it is the most wise policy which can be pursued, to obviate the necessity of incurring vast eleemosynary expense and aid, by giving employment in the execution of public works in which all are publicly benefited. From the days of ancient Rome during her republican and despotic governments, the municipalities of all civilized countries have been obliged to pursue this policy in such exigencies as will occur, from time to time, as long as the world lasts. In all our cities, where there are large numbers of persons out of employment at present, we recommend this policy to be immediately adopted, so far as it can possibly be done, by the municipal authorities.

As the question of unemployed labor and its wants is one of a very complicated character and of vast importance, we will take the

opportunity of recurring to it on a future occasion. On reference to another article in this paper, it will be seen stated that there are signs of improvement evident in various quarters, which are certainly cheering, yet the sufferings of the unemployed in this and other cities are pressing, and, of course, they cannot subsist merely upon future hopes. Something must be done for them at once in the way of temporary support. In a few more weeks it is believed that many will be employed, and thus placed beyond the need of benevolence.

Mortality among Scientific Journals.

We apprehend that few of the readers of the SCIENTIFIC AMERICAN can be fully aware of the difficulties which attend the publication of a journal devoted to scientific and mechanical subjects. We know, from an experience of twelve years, that whoever undertakes an enterprise of this character will find his path no bed of roses. The care, the anxiety, the study, and the information required to render such a journal popular, are known only to those who have had the severe experience. One of the chief difficulties in maintaining such a journal arises from the fact that readers of scientific literature are, among the great mass of the population, very few, in comparison with those who read newspapers which require no special effort of the mind to digest their contents. Another reason is that the general news of the day interests every individual and family, while the contents of scientific periodicals embrace comparatively only a limited number of popular subjects.

That our readers may catch a glimpse of the roughness of the road over which such journals are compelled to move—if they move at all—we give the following list (drawn up from memory) of sixteen journals which have “gone under,” to use a timely expression:—

New York State Mechanic, Mechanic's Mirror, Farmer and Mechanic, Scientific Mechanic, American Artisan, Mechanic's Magazine, The Mechanic, American Mechanic, Engineer's Journal, Eureka, Mirror of the Patent Office, Polytechnic Journal, Pen and Lever, Railroad Advocate, Inventor and Mechanic's Journal, American Engineer.

If there still exist any journals similar to the above, except the SCIENTIFIC AMERICAN, they are only just wearily dragging along, and will probably cease altogether by the 1st of January next. All of the above sixteen journals were commenced in periods of prosperity, and, with few exceptions, they exhibited a fair amount of ability and industry in their management.

The *Farmer and Mechanic* feebly existed through several years and finally expired. The *Mechanic's Magazine* was backed by the capital of one of the wealthiest publishing houses in New York. The *Polytechnic Journal* was in the hands of tolerably able men; and the *American Engineer*, which received its death-blow during the recent “panic,” exhibited signs of considerable “gumption.” All these seeming advantages, however, could not save their lives. Of those literary ephemera which every now-and-then flutter feebly over the fairy fields of science and art, then fall into the gulf of oblivion, it may be said—

“They come like shadows, so depart.”

Almost every journal of this class which has appeared within the last eight or ten years, has been born with a terrible grudge against the SCIENTIFIC AMERICAN, and we have been regularly “barbed at” once or twice a year by some new rival. Some of these puny periodicals have existed for one year, some for six months, and some have made only one bow to the public and then expired; and if it had been unavoidably necessary for them to pay us for the official lists of Patent Claims so often surreptitiously copied from our columns without credit, several of those journals would have died in a much shorter time.

We wish it to be understood that in alluding to the failures of the publications named in this article we do not mention the fact for the purpose of exulting over their early death, or

of conveying the idea that any remarkable shrewdness in the management of the SCIENTIFIC AMERICAN has kept it alive and made it so popular among mechanics and inventors throughout the world; but in recording our observations of the catastrophes of old contemporaries, our object is to caution any lilliputian literary gladiator who may contemplate rushing headlong into this dangerous arena.

One-idea men can never succeed in the business of scientific journalism, as many have already learned by bitter experience. So far as the SCIENTIFIC AMERICAN is concerned, we will not say that the “hard times” have not probably affected its circulation, but we can say that, in spite of the pecuniary panic that has recently convulsed the commercial world, our journal has nearly as many subscribers as at the close of the last volume, at which time the list is always largest.

Toothed Wheels.

There is scarcely a mechanical combination of any kind into which toothed or gear wheels do not more or less enter into the arrangement. Their advantages for conveying motion are so obvious and well known that it is almost an unnecessary task to recapitulate them; they are more certain than belts or straps; their motion is easy and regular, and they can be made of any size or strength. A tooth wheel is essentially a wheel having on its periphery a number of projections at equal distances apart, with corresponding indentations or spaces into which the teeth of the corresponding teeth can fit with ease. The distance from the center of one of these teeth to the center of the next is called the *pitch* of the teeth; or, in other words, the pitch is the space occupied by one tooth and one space. When the motion is not intended to be conveyed parallel to the motor or shaft which gives motion to the first, but at some angle with it, then the teeth are placed at a suitable angle with the shaft, and are called bevel wheels.

The simplest form of a toothed wheel is evidently a wheel set on an axle, a number of pegs being inserted in the periphery of the wheel, at right angles with the axle, and these fitting into the spaces between pegs placed in the rim of another wheel parallel to the shaft or axle. In constructing these teeth there are certain principles to be remembered and attended to, which we will state as briefly as we can. The first is, that gearing wheels act by direct pressure, tooth against tooth, and consequently the teeth must not be too long, or they will snap off; and, secondly, they must be of such a shape that they will meet, fit into one another and separate with ease, and yet remain in contact from the moment they meet to that in which they part, so that no pressure is lost, but a pressure is always exerted in proportion to the amount of surface in contact. On this account the shape of these teeth is of the highest importance, and to determine the proper form, many mathematicians have spent much time and labor, among whom we may honorably mention the names of Camus, Emerson, Young, and Willis. They have determined that the tooth must be thicker in the center than at either end, for there it receives the greatest amount of pressure, this through all the teeth is called the line of centers, and that if the wheel is to gear into another wheel, the sides of them should be a segment of a *cycloid*; this is the curve formed by any point of a wheel rotating along a level plane; and if the wheel is intended to gear into a rack, the *epicycloid* is the best form; an epicycloidal curve is formed by a point in a small wheel rotating around the periphery of another circle. Another good and useful curve of which to form them is the *involute*, which is constructed by fastening a pencil to a piece of string and winding it round a cylinder, then holding the point of the pencil on a piece of paper, and pulling it round so as to unwind the string.

Millwrights and machinists are generally in too great a hurry to attend to such minutiae and they adopt a much more simple method,

by drawing a number of circles until they obtain such a curve as will fit, or else swing the patterns, and cut two teeth that will gear, gradually cutting away until they obtain the desired form; and from those teeth make the remainder. Cog, gear or toothed wheels are now made on a large scale and kept in sizes, so that you have only to send the pitch and size of the wheel you want, and you will receive from the foundry or millwright's shop a wheel that will gear into the one you require.

The Mechanical Powers.

Every one knows, as a piece of school-boy acquirement, that the mechanical powers are the lever, the wheel and axle, the pulley, the inclined plane, the wedge and the screw. Very few people, however, give themselves the trouble to inquire if this classification is correct, and they may be somewhat astonished when informed that there are but two, in place of the time-honored six that have so long held an undisputed sway in the mechanical portion of all books on popular natural philosophy.

First, there is the lever; the wheel and axle and pulley are but circular levers, and their action depends on the same principles as a straight bar having a weight, a power and a fulcrum. In both there is a weight to be raised, a power to do it, and the fulcrum is the axle, or turning point of the whole. They might well be called continuous levers.

Second, we have the inclined plane, of which the wedge is but a modification, in fact, a double inclined plane, and the screw a spiral one; their power and capabilities are calculated from nearly the same data, and the methods by which each of them attains its desired end is in principle precisely the same.

A Word about the Times.

We are glad to announce that amidst the general gloom which has pervaded all classes of the community for some weeks past, there are now visible some signs of improvement in various quarters. It is an acknowledged fact that for all practical purposes there is an abundance of money in the country; and now that the panic has spent its full force, those who have been “hoarding” are beginning to come out, and are looking around for some safe opportunity to invest it. The New York city banks hold nearly \$20,000,000 in specie, which is a much larger sum than they have had for many months; stocks have rapidly advanced on the exchange; several large manufacturing establishments are beginning to renew their operations; and the great grain crop of the West is flowing to the seaboard. These are all cheering signs, and we hope soon to see the general interests of industry once more in a healthy and prosperous condition. Let us all take courage, for “the good time is coming.”

The Adriatic.

The steamship *Adriatic* has been, it is hoped, satisfactorily completed. She went down the bay on her first trial trip on Friday, the 13th inst. The morning was rainy, and this first spontaneous movement of the magnificent vessel attracted little attention, but the machinery appeared to work in every respect successfully. Much attention has been called to this ship by her large size, and the alterations which have been necessary in the construction of her engines. We intend to keep our readers informed of her progress until complete success has been established.

ANOTHER COMET.—A faint telescopic comet was discovered on the evening of the 12th inst., at the Observatory of Harvard College, by Mr. Horace P. Tuttle, near the star Theta Draconis. This comet is the sixth which has appeared in 1857. We believe it is the thirteenth or fourteenth discovered at this observatory, before any information had been received of their having been seen elsewhere.

The steamship *Arabia*, which arrived at this port on the morning of the 13th, brought the welcome news that Delhi was in the possession of the British.