Scientific American.

MUNN & CO., Editors and Proprietors. PUBLISHED WEEKLY AT NO. 87 PARK ROW, NEW YORK.

O. D. MUNN.	A. E. BEACH.
TERN	ts.
One copy, one year, postage included	
One copy, six months, postage included.	1 60
Club R	ates:
Ten copies, one year, each \$2.70, postage	included
Over ten copies, same rate each, postage	e included 2 70
By the new law, postage is paya	ble in advance by the publishers, and
the subscriber then receives the paper fr	ee of charge.

NOTE. -Persons subscribing will please to give their full names, and Post Office and State address, plainly written, and also state at which time they wish their subscriptions to commence, otherwise they will be entered from January 1st, 1st... In case of changing residence state former address, as well as give the new one. No changes can be made unless the former address

VOLUME XXXII., No. 4. [New Series.] Thirtieth Year.

NEW YORK, SATURDAY, JANUARY 23, 1875.

Contents.

(Illustrated articles are marked with an asterisk.)		
Acid, mordant (III)	59 Magnets, electrolytic 5	
Air motor (7)	59 Mail, luse of a large 4	
Air, pressure of (21)	59 Measuring distances by a glass (83) 6	
Airtight can vas, etc. (85)	60 Measuring land (17).	
Almonds in California	56 Measoring surfaces by weight <	
Amalgam fillings for teeth49,	55 Metals, relative weight of (19) 5	
Answers to correspondents	59 Mill River disaster, the second 5	
Aquarlum and plant case	55. Mining in Massachusetts 5	
Astronomical discoveries in 1874	53 Moon's axis in an eclinse (87) 6	
Beginners	53 New books and publications, 5	
Belts, Joining	57 Nitroglycerin as a motor	
Helts, splicing targe	53 Odontograph, the (19)	
Ressemer oscillating saloon, the.	50 Paint impervious to sloohol (83) 647 Paper clothing, Japanese 55	
Blower, rotary pressure*		
Boilers, testing (6)		
Box trick, a, to best Hartz',		
Brains.	56 Patents, official list of	
Brass, cleaning.	54 Photography, beginners in	
Brass, expansion of ((4)	59 Pills, sugar-coated (26)	
Bridge, speed over a (11),	59 P't-ryi 4	
Business and personal	59 Planer, a simple (31)	
Business, a novel	47 Pole, reaching the (36)	
Cable towage, success of	49 Pules and the sessons (30).	
Canal navigation, improved	49 Postal card, new	
Car wheel htting	49 Postal card, new 55 Potato cutter and planter 5	
Car wheels	so rocaco, toe American (29)	
Car wheels, m(leage of	56 Pruning shears, improved 5	
Cornadum wheel, to true a	56 Railway, single rail	
Docke, Jubular finating	5i Railway tle, Improved	
Egge, preserving. Eugine cylinders, lining*	49 Recipes, useful 52 Saws, circular (S8). 5	
Engineers' and fremen's pay (10).	50 Scumeting as anidamic	
Engineers and aremen a pay (101.,	59 Scarlating so epidemic. 4 59 Solid and hollow bars (1)	
Engines, small, 52, (16, 31) Engines, small boat (24).		
Engines, small, castings for (9)	59 Steam, high and low prossure (3).	
Engines, thumping (8)	59 Sun's amplitude, the (34)	
Enelid (25)	59 Towage, plan for, wanted 4	
Fibers, vegetable, at Vienna	Office Corve. the (2d)	
Fire, precautions in case of	57 Triching (27)	
Gaging casks (29),	59 Valve, eguillorium (12)	
Gas, heat and volume of [5]	59: V&lve, gridicon (19)	
Germination, phenomena of	57 Valve, sniffing (12). 50 Varnish for white woods.	
Gravel walks, concrete	50 Varnish for white woods 4	
Grit wauted	32) Yenus as a luminous ring	
Gune, Varnish for (22)	59 Ward, Captain E. B 4	
Mexagons, etc., inscribed (19)	ool water in wells, love in (so) 5	
Horse power, indicated (20)	59 Water, weight of	
Inventions patented in England	49 Weight, testing figures by	
Lumber accident, a	58 Wheels, rejecting doubtfut	
Enmoet accidenc, a	56 Wood incombustible, making	

THE SOVEREIGNS OF INDUSTRY.

During these times of financial depression, when the great industries of the country are languishing and labor is everywhere out of employment, diminished incomes are the rule, and economy the virtue most in demand. To those whose incomes are still liberal, though never so much less than heretofore, the problem of adapting expenditures to receipts is comparatively simple. They have merely to cut off a few luxuries more or less, to pinch their pride a trifle, it may be, but with no risk of trenching on the actual necessaries of life, either for themselves or their families.

For the great mass of working men, however-men whose wages never greatly surpassed the cost of living—the problem rative stores are secured, with none of the risks. is not so simple. To strike off luxuries would help but little,

The usual door of escape from the ills of poverty, hard work and more of it, is closed by the general stagnation of industry. Men are fortunate if they get any work, at reduced prices at that. How then can they manage to live? There is but one way, and that is by increasing somehow the purchasing power of money, so that the little they now have may go as far as the larger sums they have been used to: a forty-seven councils, with a membership of over five thouhopeless undertaking, it might seem, for men without capital and with no influence in financial circles: but so it did | thousand of the more thrifty mechanics and laborers of the not seem to the working men of New England, spurred on small State of Connecticut thus banded together for mutual sheet. The two are now weighed separately. The weight by that most efficient sharpener of the wits, necessity. The problem was to make two dollars buy as much as three. prices remaining the same. A glance at the conditions of agency of the order-certainly an amount worth considering. trade will suffice to make plain the efficiency of the means adopted. During the flush times, before the collapse of 1873, money was plentiful, business brisk, and profits large. Consequently the race of middle men multiplied enormously. Between the miller and the mechanic, the price of a barrel of flour increased fifty per cent or more by passing through half a dozen hands, each charging roundly for the nominal and, for the most part, uncalled-for service rendered. In like manner, the cost of nearly every other article of food or clothing was similarly advanced. With high wages and plenty of work, the consumer was able to pay the extra charges; but when the easy times were past, his lessened is inevitable. wages left small margin for the support of go-betweens. The machinery of trade had become so cumbrous and costly that it was a burden rather than a convenience. Its excrescences had to be cut away; and this the working men of the East have set out to do, holding it suicidal as well as foolish to pay half a dozen large profits on each article they buy, when they can be served as well for a single small advance on

barrel of flour. By going to the retail grocer they can get such an article as they desire at the rate of ten or twelve dollars a barrel. On the other hand, by clubbing their funds and buying a car load at the mill, the same grades of flour can be got for seven or eight dollars a barrel, transportation and delivery included. So likewise with nearly every other standard article; by jumping the needless middlemen and buying for cash at first hand, the purchasing power of wages may be immensely augmented, without doing injustice to any one.

It is but a short and natural step from temporary combinations for mutual benefit to permanent organization. This the lid of the box which served as a coffin, the white linen step has been taken; and under the somewhat grandiloquent bag in which the fakir had been placed was found to be miltitle of "Sovereigns of Industry," the new organization is dewed. When the bag was opened, the temporarily dead drawing together the working men of the Eastern States with man's arms and legs were found to be shriveled and stiff; a rapidity rivaling the development of the Grange through- and his head reclined, corpse-like, on his shoulder. To all out the West.

Thus far the Sovereigns have stuck to their original idea of mutual helpfulness in supplying the necessaries of life to the members of their several councils. It is to be hoped that they will continue to do so, avoiding strenuously the political follies of the Grangers. It would be a pity if the power which the order is capable of wielding for the economical advancement of the great army of manual and mechanical workers of the country should not be developed to the uttermost as it can be only by the most stringent repression of demagogues and party schemers.

Various plans of operation are adopted by different councils, according to the number of members, their place of residence, and the local advantages for buying. The chief object being to make the most of the money they have to spend, with the least inconvenience or risk, it is a common practice to avail themselves of the machinery of trade already established in their neighborhood, taking care, however, to pay no exorbitant profits. An arrangement is made with one or more dealers in each department to throw the trade of the council into their hands in consideration of a special discount on regular retail prices, a concession which the favored dealers can well afford to make in return for an assured cash custom, without the cost of advertising or other outlays for attracting customers. Every three months the council receives the bids of dealers desiring its trade, and elects those which offer the greatest inducements, all things considered. Tickets of membership are then issued, the exhibition of which entitles the bearer to the stipulated discount on all goods purchased during the ensuing quarter. In all cases the council takes pains to secure trade circulars and lists of wholesale prices current, from which to estimate the justness of the charges of their local dealers. If the members can do better by ordering their supplies from the producer or the wholesale dealer, the local dealers lose their trade altogether.

In many cases large dealers undertake to fill the orders of councils at a slight advance on wholesale rates, delivering to the appointed purchasing agents the articles in separate parcels as required by the members, thus enabling the mechanics of the most out of the way village to command as favorable terms as the market will afford. Where the purchases are considerable and tolerably regular, it has been found a very satisfactory way to hire a cheap store room, and appoint one of the members storekeeper for the council, to distribute the purchases as called for, on certain evenings of the week. At the regular monthly meetings, the members elect the amounts of the several articles required, which are purchased in bulk, and of course on more favorable terms than in separate parcels. By this plan, most of the advantages of co-ope-

In several States, it has been found advantageous (experi not many luxuries falling to their share even in the best of mentally, at least) to mass the trade of the order, or a great times. To lessen the amount of their purchases means to eat portion of it, by appointing a general purchasing agent, poorer food, or less of it, wear cheaper clothing and live in through whom the supplies for the councils are ordered, the poorer houses; in short, to submit to evils, not to practise superior advantages of such a buyer more than offsetting the cost of the increased machinery.

An idea of the rapid spread of the organization may be gained by the rate at which the order has grown in Connecticut. The first council, with seven members, was organized February 26, 1874. In May a State council met, with a mem bership of twelve hundred. By August, this number was more than doubled; and at the meeting of December 8, sand, were represented. To-day, there are probably near ten benefit in trade. Thus far, the estimated saving to each of the paper figure of the land, divided by the weight of the member is thirty per cent of his purchases through the Such a sensible and practical "strike" for increase of wages is something new in the annals of industry.

Besides the State councils, a national council has been organized. It will hold its session for 1875, probably before this reaches the eye of the reader. For what practical purposes the session will be held does not clearly appear to outsiders. We can only hope that it will take no action to complicate the objects of the order, or to divert its work from its original purpose. National councils are apt to be over ambitious, and the temptation to use a popular organization for political purposes is hard to be resisted: if indulged in, ruin

A BOX TRICK TO BEAT HARTZ.'

According to travelers' stories—the best of all evidence, as everybody knows-there used to be in India a school of vagabonds who got their living by dying. For a very modest sum they would emulate the frogs which are periodically

prime cost. For example: A hundred laborers want each a innumerable rings of annual growth—and retire for a specified period from the cares of this life. They professed to have such control over their vital processes as to be able to die at will, and would allow themselves to be sealed up in coffins or tied up in blankets, and buried underground for a week or a month or more.

> A very circumstantial account of such an operation was given by Sir Claude Wade. When he was at the court of Runjeet Singh, in 1837, a fakir was thus buried for six weeks, a company of soldiers guarding the place of his interment to prevent untimely resurrection. At the end of the six weeks the seals were found intact; and on removing appearance he was as dead as an Egyptian mummy, no pulsation or other evidence of life being discoverable. He was then turned over to the manipulations of his servant, who made warm applications of various kinds, whereupon the arms and legs gradually returned to their normal state. He then removed the wax and cotton with which the fakir's nostrils and ears had been closed, and after half an hour the devotee was able to speak. All of which Sir Claude vouches for as an eye witness, with an air of truthfulness rivaling that of About's clever story of the man with the broken

> This art of dying at will and coming to life again appears not to be monopolized by the Hindoos. At least one Englishman in modern times, if human testimony is worth anything, has attained it. His name was Townsend, Colonel Townsend of the British army in India. This man could go into a death-like trance at will, so skillfully counterfeiting real death that the most critical observers were deceived. On one occasion the experiment was made in the presence of Dr. Cheyne, who reports upon the case, Dr. Baynard and a Mr. Skrine. All three felt his pulse: it was distinct, though small and thready; and his heart had its usual beating. He then composed himself on his back and lay motionless for some time. Gradually all signs of life disappeared, till there was no pulse, no beating of the heart, and a mirror held before his mouth gave no indication of breath.

> The witnesses discussed this strange appearance for a long time, finally concluding that he had carried the experiment too far and was really dead. As they were about to leave him, a slight motion of his body was observed, and a beating of the heart. In a little while he began to breathe, and gradually life was fully restored.

> This account has been accepted as trustworthy and credible by high medical authorities, and so likewise have those given of the fakirs who carried the experiment a degree further than Colonel Townsend, and submitted themselves to actual burial.

> It is a pity the art has not been more widely cultivated; it would afford such a convenient refuge for geniuses born ahead of their time. On finding their generation too stupid to appreciate their grand discoveries and projects, they could retire for a season until in the regular course of events the masses should overtake them. Then instead of writing a book and depositing it, sealed, in a public library, to be opened in the year 1975, or such a matter, they could themselves be so deposited, duly labeled and preserved, till their time should come. We could name a good many whose acquaintances would gladly provide fireproof quarters for them and their projects for a century or two. The only fear that the fakirs had of protracted burial was that in the meantime their servants might die and there be left no one to resurrect them. In cases such as we have imagined, there would be no risk of this sort to deter the devotee, the community at large assuming the responsibility.

TESTING THE CORRECTNESS OF FIGURES BY WEIGHT.

We publish in another column a communication from our well known correspondent Dr. P. H. Vander Weyde, in which he suggests a rather novel and effectual method of testing the correctness of all calculations such as those pertaining to the squaring of the circle, and the contents of circular or other forms. His method is based on the practice, adopted sometime ago, of measuring the area of land by weight, in which the figure of the land is drawn to a scale on paper, and the figure cut out of the sheet. The figure of a square acre is also drawn to the same scale and cut from the paper paper figure of the square acre, indicate number of acres contained in the land.

Applying this method to the squaring of the circle, Dr. Vander Weyde weighed the circle of paper and the proper squares, with the results given in his letter. It will be seen that the calculations of some of our prominent circle squarers, when thus weighed in the balance, are found

P'I-RYI.

Among the ways that are dark and tricks that are queer. for which the "heathen chinee" is peculiar, one of the cleverest bears the name p'i ryi. It fairly rivals the jugglery of our highly enlightened writing mediums, and is employed for the same useful purpose. When the pig-tailed earnest enquirer realizes the truth which the Widow Bedott versifies:

> "Poor short-sighted critters, we Kant calculate what's going to be And, like enough, never'll take place:"

discovered alive in solid rock—or in tree trunks, overlaid by he consults an oracle, much as pig-headed enquirers do with