

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, postage included..... \$3 20
One copy, six months, postage included..... 1 60
Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.
Single copies of any desired number of the SUPPLEMENT sent to one address on receipt of 10 cents.
Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly; every number contains 16 octavo pages, with handsome cover, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, postage paid, to subscribers. Single copies 10 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of seven dollars. Both papers to one address or different addresses, as desired.

The safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in a commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

VOL. XXXIX., No. 11. [NEW SERIES.] Thirty-third Year.

NEW YORK, SATURDAY, SEPTEMBER 14, 1878.

Contents.

(Illustrated articles are marked with an asterisk.)

American Association.....	161	Inventions, new engineering.....	165
American Institute Exhibition.....	161	Inventions, new.....	169
American plows in France.....	161	Inventions, recent.....	165
Arctic expedition. American.....	161	Micro-telephone.....	171
Astronomical notes.....	170	Mixing separator.....	166
Business and personal.....	171	New books and publications.....	171
Carbons, electrical (1).....	171	Notes and queries.....	171
Cement, Chinese (3).....	171	Patents, official list.....	171, 172
Cement, hydraulic.....	166	Patents, American, for export.....	163
Charitable colonizing.....	169	Patents, English.....	172
Cheese and meat, shipments of.....	168	Plows, Paris Exhibition.....	162, 165
Coffee pot, new.....	168	Prize for an invention.....	161
Diamond cutting, American.....	170	Railway car window.....	163
Electrotyping (2).....	171	Rarus, speed of.....	170
Facade of Danish section.....	159, 161	Sheep protector.....	166
Fire escape, automatic.....	169	Speculative mining.....	160
Fish culture in the Far West.....	168	Steamship, new.....	167
Fish culture in Wisconsin.....	161	Steel tow lines.....	163
Fish lines, waterproofing (8).....	171	Tailor bird.....	167
Flea, cat (3).....	171	Telephone, thread.....	165
Fly paper (12).....	171	Texas, growth of.....	168
Fulminate for shells (11).....	171	Timber, consumption of.....	168
Gas, use of, rural.....	171	Times, Prof. Summer on.....	170
Indian ink (3).....	171	Value of obs. in invention.....	160
Ink, violet copying (5).....	171	Waiting for something to turn up.....	160
Inventions, new agricultural.....	165		

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT No. 141.

For the Week ending September 14, 1878.

- I. **ENGINEERING AND MECHANICS.**—Improved Locomotive Exhaust Chamber, 8 figures.
The Sewage System of Paris. The cleansing of the sewers, etc. The Sewage Utilization works at Gennevilliers.—The Pneumatic Process of Sinking Piles. By JOHN W. GLENN, C. E.—New Safety Valve, 2 figures.—Improved Feed-water Heater, 5 figures.
The Pioneer Railway proposed for South Africa, and the Cameron Pontoon Cart, with 5 illustrations.—California Gold Mining.
How to Build a Greenhouse; full directions and dimensions, with 11 figures.
A New Form of Toothed Gearing. Elliptical Bevel Wheels. By Professor C. W. MACCORMACK. How to design the wheels, with 5 figures. An interesting and neglected field of investigation.
- II. **TECHNOLOGY.**—Making Electrotypes from Drawings. By JOSEPH BROWN.—An Improved Camera Lucida, 2 figures.—Photographic Engraving in Half-Tones.—Cleaning of Glass Plates and Lenses.
Concerning thread. Ornamental Design for Album Cover. By E. DE ZULOAGA, 1 illustration.—Utilization of Waste Products.
- III. **FRENCH INTERNATIONAL EXPOSITION OF 1878.**—M. Krantz, Commissioner General of the Exhibition, with Portrait.—The Gallery of French Furniture, 1 illustration.—The Exhibition Elevator.—The Metallurgy of Platinum. The fusion of platinum; the patent autogenous soldering; apparatus for the concentration of sulphuric acid; alloys of platinum.
The Janichkov system of Electric Lighting. The system of alternating currents. The Gramme magneto-electric machine, with 5 figures.
The Plows of all Nations. Agricultural implements from Malasia, Italy, China, and the Colonies of Holland. The plows of Spain and Denmark. The display from England, France, and the United States. The wheeled plow. Differences between English and American plows. The merits of French plows.
First Prize Danish Cow, and First Prize Charolaise Bull, with 2 illustrations.
- IV. **CHEMISTRY AND METALLURGY.**—The Leaching of Silver Ores at Irapuato, Mexico.—Magnesium Nitride. By J. W. MALLETT.—Chemical News Notices. Telephone without electro-magnet. Thermic researches on the chromates. Single liquid battery. Trichloric acetal. Ethoxyacetone. Ethylic glycolate. Anaerobiosis of micro-organisms. Emissive heat power. Experiments on capillarity. Differences of the affinities of chlorine, bromine, and iodine. Quantitative spectral analysis. Researches upon fluorescence.
Thermometric scales. Comparative scale of Reaumur, Centigrade, and Fahrenheit, with formula for converting the units of the one scale into units of another.—The Precious Metals. Total yield of the earth since the creation.
- V. **ASTRONOMY.**—Professor Henry Draper's Eclipse Observations.—Recent Photographic Observations of the Solar Surface.—Sun spot Screen for Small Telescopes. By B. TEMPLAR, F.R.S., 2 figures.—A New Method of Grinding Glass Specula. By Professor ELIHU THOMSON. Full directions to amateurs. A simple and accurate method, with 5 figures.
Scientific Phenomena and their Relations. Address before the American Association for the Advancement of Science, by the President, Professor NEWCOMB. The two modes of explaining natural phenomena, and the relations between science and theology.
- VI. **MEDICINE AND HYGIENE.**—Hygienic Congress.—Poisoning by Paris Green.
The Electro-capillary Phenomena of the Human Body. From the French of E. OUDMUS and CHARLES LEGRAS. M. Requeret's principles. Researches into the electrical currents of the human body, with experiments.
The Evolution of Vertebrate Limbs.

Price 10 cents. For sale by all newsdealers

WAITING FOR SOMETHING TO TURN UP.

He had formerly been a printer, he said to the Congressional Labor Committee; but for the past two years he had been "one of the unfortunates who had been obliged to wait for something to turn up." His name was W. Godwin Moody, of Boston; and while waiting for something to turn up he had—like so many idle men—solved the labor problem—to his own satisfaction. When the Committee asked him a plain question or two, however, calling for facts instead of confident assertions, Mr. Moody got ~~very~~ mixed up, the reporters said, and "floundered into all sorts of ridiculous assertions, theories, statements, and vagaries, highly amusing to listeners." Of one thing he appeared to be very sure, namely, that he was one of some 3,780,000 men in the United States, unemployed and waiting for something to turn up. Seeing that even Kearney's number is nearly a million less than this, there is reason to believe that Mr. Moody's statistics are not wholly to be depended on, especially as the results of the recent labor census of Massachusetts conclusively prove that Mr. Kearney overstates the number of the unemployed at least ten to one. But let that pass: the fact remains that there are a good many people to-day in Mr. Moody's situation, idle and waiting for something to turn up. The proportion of the idle (willing or unwilling) to the employed is probably not much if any greater than obtains during the most prosperous times; still the aggregate for the whole country must be considerable. Whose fault is it? and how is the difficulty to be remedied?

We fear that many of them, a very large proportion indeed, are like Mr. Moody, idle because they prefer to spend their energies in denouncing capital and machinery, while waiting for something to turn up, rather than buckle to and help to make something turn up. Things do not turn up very well of themselves; and in the busiest times the men who have not force enough to make occupation for themselves are little likely to have employment thrust upon them, except under conditions neither enjoyable nor personally profitable. Mr. Moody was formerly a printer. What hinders his being a printer now? If we mistake not the demand for printers is as great as it ever was. With but few exceptions the same is true of every sort of labor. Where the aggregate amount of labor called for in a particular field has been largely and permanently diminished, as in the case of iron makers by the substitution of steel for iron in the arts, the only thing for the displaced workmen to do is to try something else. To fold their hands and wait for something to turn up is to invite starvation.

It used to be the boast of American workmen that so long as they had health and hands they were practically independent. If one calling failed they could turn to something else. If no man wanted to hire them they could be their own bosses, and at least make an honest living while waiting for the occupation they preferred to come around again. Such is the industrial condition of the great majority of American artisans now; and these men are not without something to do. The small minority that choose to wait in idleness for something to turn up, but take pains not to assist in turning up anything, are very apt to be in Mr. Moody's condition—and deserve to be.

In times of severe commercial depression and consequent industrial distress, such as recently prevailed among us, many thrifty and industrious people are thrown out of work by no fault of their own; but they do not helplessly wait, year after year, for something to turn up. They bestir themselves, do what they can, and rarely have to wait long for remunerative employment. The minority, who will do one thing or nothing, and rather prefer the latter, are apt to make a great hullabaloo about their personal grievances and the hardness of the times; but they do not distinguish themselves by practical or strenuous effort in the way of productive industry. Life times are bad for them, chronically bad, always, however busy their neighbors may be; and the thrift and prosperity of others only make their case seem all the worse in their own estimation. They will not see that their misfortune arises oftener and more largely from causes purely personal—incompetence, intemperance, lack of force, or lack of integrity and moral worth—than from hard times or an insufficient demand for labor that is worth hiring. With the utmost sympathy for the unfortunate, we have none whatever for self-made misery; still less for those who quarrel with the natural order of things, demanding that the government shall overturn society for their exclusive benefit.

CHARITABLE COLONIZING.

It has frequently been urged in the Congressional Labor Committee and in the public journals that Congress might do much toward equalizing the distribution of labor by gathering up the unemployed and putting them upon new lands in the West. Indeed, the idea of colonizing the idle is a favorite one with many theoretical philanthropists. They forget, however, the essential fact that a successful colonist must be a man of more than average resolution, patience, and ability. He must be willing to work long and hard, to endure pluckily many privations, in the hope of future reward; and often he must expect the reward to come not to himself, but to his family after he is dead. He must be able to stand on his own feet; to hew his own way in the world; and be willing to be deprived of society and social props.

The idler, in city or town, is very apt to lack each and all of these qualifications. Most likely he is idle because he

falls far below the average in self-reliance, capacity, energy, and thrift. Put such a man on the best piece of land in the world, away from society, and he would either run away or starve. Men of that stamp are not the stuff out of which successful colonists are made. As Mr. Hinchman somewhat roughly put it: "Those who would suffer themselves to be transported free to the public lands would not be worth the freight."

VALUE OF OBSERVATION IN INVENTION.

It is said the world over that "necessity is the mother of invention," but the fact is that only a small proportion of the patented inventions of the day have been called forth by sheer necessity. The multitude of inventions made in this country may be attributed chiefly to the great desire of Americans to acquire wealth.

While some men invent because they perceive and appreciate a need therefor, others in a laborious way study and experiment almost without special aim, having a desire to do something, without knowing whither to direct their thoughts. It is not so difficult to devise means for accomplishing a known object as to discover that the thing needs to be done. It thus appears that a vital point with the inventor is to see where chances for improvement lie. Close and well directed observation only can reveal these opportunities.

It may be said that to follow any line of investigation requires a special knowledge of that particular line, and that it is impossible for any person to have a comprehensive knowledge of everything; but the history of invention shows that many important improvements have been made by persons unfamiliar with the art to which the inventions pertain. This is accounted for by the singular blindness of most men to the defects of things with which they are best acquainted.

A systematic inspection of every device, whether new or old, therefore, with a view to the discovery of possible chances for improvement, and a close observation of methods of doing things in the various branches of manufacture, and in every day life in the household, are, generally speaking, a sure means of opening the avenues that lead to success. Nothing should escape the notice of the inventor. He should train himself to observe, weigh, and consider everything that comes under his notice, and thus acquire habits of observation which are of more value than capital.

It is not essential to the success of an invention that it should be better than others of its class, nor is it always requisite that it should be less expensive. If the new device is equally as good as the old, costs no more, and accomplishes its object in a different way, it will with proper management command a place in the market. It is therefore in the province of the inventor not only to develop things entirely new, but to try to accomplish known results by new means. The success of an inventor in doing these things depends to a great extent on his power of observation.

SPECULATIVE MINING.

It would seem but natural to suppose that the recent years of commercial distress and shrinkage of all property values would have taught every one having money left to invest to discriminate between shadows and substance, but it is plainly evident that such is not the case in every instance.

How much probable substance is there, for example, in the twelve mining companies which, we learn by our exchanges, have organized in California and contiguous States during the past six weeks, with stock capitals of \$10,000,000 each, an aggregate of \$120,000,000?

How much of this represents substance and how much the thinnest shadow?

If we were to allow \$1,000,000 for the purchase value of each mine (assuming the property to be exceptionally valuable) and the machinery and labor requisite for its development to the point where its revenues would (if ever) exceed its expenses, we should be considered liberal in the extreme; as rarely, or never, has a mine been properly worked whose "true inwardness" has not been arrived at or understood with an expenditure of half this amount. Of what use, then, is the remaining \$108,000,000 of stock, unless it is to be philanthropically distributed among "outsiders," at ten cents on the dollar, to give them opportunities for practical knowledge of assessments?

The passion for gambling, which in some measure is inherent in all men, is shrewdly understood and taken advantage of by exploiters of affairs like these, and hence they offer the alluring bait of ten chances for a dollar with very reasonable hopes of success, and count, by the manipulation of stocks and levying of assessments, to close the game in due course of time, with stock, dividends, and mines all under their control.

So often and successfully has this game been played that one almost ceases to pity the willing victims, whose folly renders the success of such impositions possible.

These relics of the old times must be utterly repudiated by all those who are interested in the legitimate development of our mining interests; and the sooner they are struck out of existence the sooner will mining enterprises in general win their deserved position in the estimation of the public.

Speculation increases at the San Francisco Mining Exchange, and fortunes are reported to have been suddenly made by the rise in Ophir, Bodie, Grand Prize, Mexican, Union Consolidated, and others. The Bodie, which has but recently attracted attention, is in Mono county, California, and a recent shipment of \$134,000 from it, as the result of a ten days'