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 tratis for every club of five subscribers at \$3.20 each; additional copies at ame proportionate rate. Postage prepaid.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly; every number contains 16 active pages, with handsome cover, antiform its size with SCIENTIFIC AMERICAN. Terms of subscription for SCIENTIFICAN IN CONTROL PROPERTY AMERICAN. Terms of subscription for SCIENTIFICAN IN CONTROL PROPERTY SINGLE COPIES OF SCIENTIFICAN IN CONTROL PROPERTY AND ACCOUNTS.

Combined Rates. -The Schnerfel American and Supplement will be sent for one year, postage free, on receipt of seven dollars. Beth 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 Roy, N. Y.

Publishers' Notice to Mail Subscribers.

Mail subscribers will observe on the printed address of each paper the me for which they have prepaid. Before the time indicated expires, to saving a sentiment of a numbers, subscribers should count for another year, or the convenience of the mail clerks, they will please also state when this subscribers.

or the convenience of the final clerks, they will desse also state when eir subscriptions will be entered from the time theorder is received; to the back numbers of either the SCENTIFIC AMERICAN or the SCEN-FIC AMERICAN SUPPLIMENT will be sent from January when desired, this case, the subscription will date from the commencement of the dume, and the latter will be complete for preservation or binding.

VOL. XXXVI., No. 25. [New Series.] Thirty-second Year. NEW YORK, SATURDAY, JUNE 23, 1877.

(Illustrated articles are marked with an asterisk.)

Alum in bread, estimating	393	Ink, new copying	38
American Science Association	393	Inventions patented in England.	39
Answers to correspondents	3)5	Inventors, helping	38
Axles, greasing	391	Inventors, helping Knowledgeis i ower	389
Babbitt metal boxes (1)	355	Lathe for turning iron (2)	39;
Beef extract, dissolving (24)	3.15	Lightning rods	39
Birds' nests	333	Machine shops, waste in	389
Birds' nests	386	Magnets, connecting (27)	3.1
Blowpipe apparatus	391	Magnets, making (25)	39:
Blue glass blindness	341	Marbleizing iron (37)	390
Bread, etc., adulteration of		Metals, preserving	38
Business and personal		Milk and butter	39
Calf muzzle*	386	Mirrors, dull (15)	395
Carbonicoxide, test for	396	Moulding in plaster (38)	390
Cement, very hard (11)	395	Mount Carmel, Ill	393
Chimneys, building (20)	395	Nickel, melting (42)	3:8
Chlorides for watering streets (21)		Ohm, the (34)	390
Cistern, leaky (7, 26)	395	Olcomargarin, detection of	. 3.
Cockroach utilized, the		Parchment, damp (20)	39
Coins, non-conorous (13)	395	Patent decisions, recent	39
Cords, strength of (5)	395	Patents, American and foreign .	39
Correspondence, Washington	388	Patents, official list of	3:X
Disinfecting drains, etc. (9)	395	Petroleum trade of New York	35
Drunk or diseased	334	 Pootegraphy, chemistry of (23) 	
Electricity in galvanism, etc	391	Pipes, water through (30)	39
Employers and working men . Engine, steam ports of an (4)	339	Planing and polishing machine*.	381
Engine, steam ports of an (1)	395	Plating, cleaning before (32)	
Engines, cut-offs of (33)		Polishing gun stocks (36)	390
Files cracking in tempering (6)	395	Potato bugs and potassium (41)	33
Fires in ships, extinguishing*	14404	Powder paper (17) Practical mechanism—No. 29*	533
Fishes, perspiration of (18)	2.2	Practical mechanism-No. 25*	387
Flowers by mail (16)	335	Riches and reason	000
Fly paper (22)		Rifle, the Peabody	38
Fruit, American, in Europe	348	Silver plate, discolored (12)	50
Gold, transparent	355	Slide valves, lap on (8)	39,
Governor, the Allen	333	Stains, upt le, on muslin (19)	395
Grain elevator, New York city*		Stains of oil on granite (14)	390
Gravestones, about		Steamboat trip, the first	350
Guns for Turkey	350	Sweating in buildings (7)	393
Heat, nonconductors of (38)		Tornado in Illinois	333
Heated air for the lime light		Tertoiseshell, scraps of (10)	5, (1)
Hellgrammite, the*	3732	Walls, brick and stone (31)	000
Horn, clarifying (4d)	3.91	Waterproofing pants (35)	396
Horse boot*	396	Whalebone (3)	333
Hothouse, building a (28)	895		

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT, No. 77,

For the Week ending June 23, 1877.

For the Week ending June 23, 1877.

I. ENGINEERING AND MECHANICS.—Boilers of the Havemeyer Sugar Works, New York. With 8 engravings.—On the Mechanical Firing of Steam Boilers. By W. J. Pearses. An interesting and valuable paper lately read before the Society of Engineers, Lendon, With one page of engravings.—Solvay's Distilling Apparatus for coal gas liquor. By Dr. G. Thi. Gerlach: All llustrations.—Plees for Gas and other purposes. Main-Laying. Three engravings.—The Waterworks at Banger, Maine, by L. H. Batton, C.E., Engineer Bangor Water Board. Hillustration.—Thornyeroft's Screw Propeller, with 2 illustrations.—Pé dile Engine for Light Draught Steamers, I engraving.—The City of Pittsburgh, with an account of its Manufactures.

On the Minute Measurements of Modern Science. By Alfred M. MAYER. Article VIII. The Cathetometer and its practical applications.—New Water Heater for Steam Engines.

Improvement in Iron and Steel Manufacture. By T. A. FREEMAN.

tions, 3 figures.—New Water Heater for Steam Engines.
Improvement in Iron and Steel Manufacture. By T. A. FREEMAN.

II. TECHNOLOGY.—Fifty Practical Recipes—Elsner's Green, Bremen Blue, Wild Yellow Lake—Treating Lubricating Oils.—A new Solvent for Silk.—Portraits in Wateh Glasses.—Iron and Steel Manufacture.—Machine for Drying Crystals. 1 engraving.

Pipes for Gas and other purposes. Main-Laying. 3 engravings.—Inventions and Improvements announced Abroad, including the following items; Loading Silk: Cleaning Yarns by Friction; Shuttle Improvements: Dyeing Loading Silk: Cleaning Yarns by Friction; Shuttle Improvements: Dyeing Loading Silk: Cleaning Yarns by Friction; Shuttle Improvements: Dyeing Loading Engages; Bidliant Cotton and Hemp; Sorting Rags: Bleaching Wool; Olive Wood for Shuttles; New Mode of Decorating Muslins.—Designs for Ornamental Scissors, Knives, and Forks. 1 engraving.

Fifty Syrap Recines for Household purposes, Mineral Waters, etc., twit: Surge, Syrap, (2) Lemon Syrap, Mulberry Syrap, Vanilla Syrap, Vanilla (ream Syrap, Section Syrap, Surge, Gringer Syrap, Carne Syrap, Banana Syrap, Mulbersyna Syrap, Colores Syrap, Strawborry Syrap, Colored Syrap, Carne Syrap, Ragion Syrap, Colored Syrap, Strawborry Syrap, Colored Syrap, Mulberry Syrap, Pander Syrap, Cherry Syrap, Francosias Syrap, Excelsior Syrap, Pander Syrap, Champagne Syrap, Sherry Cobbler Syrap, Excelsior Syrap, Pander Syrap, Currant Syrap, Cannes Syrap, Champagne Syrap, Sherry Cobbler Syrap, Excelsior Syrap, Pander Syrap, Currant Syrap, Champagne Syrap, Strawborry Syrap, Excelsior Syrap, Malenhair Syrap, Congent Syrap, Currant Syrap, Cannes Syrap, Cannes Syrap, Currant Syrap, Cannes Syrap, Cann

III. CHEMISTRY AND METALLURGY.—New Oxygen Retort, by Wm.
J. CHADWICK; 2 figures.—Preparation of Pure Bismuth.—Explosion of
Nitro-bydrochloric Acid.—Synthesis of Urea.—Estimation of Boracic
Acid.—Formation of Saltpeter by Organic Ferments.—Density of Alum
Solutions.—New Method of Mannfacturing Sulphides. Carbonates, and
Alkaline Sulpho-carbonates.—The Ferments contained in Plants, by C.
KOSMANN.—Action of Hydrosulphite of Soda on the Hematosin of the
Blood.—New Ureometer for Clinical Use.—Neptunium, a New Metal.
—Selenium in Refined Silver.—Proceedings of the German Chemical
Society, Berlin. With notices of a large number of new researches by
prominent members. Society, Berlin. Wi prominent members

ELECTRICITY, LIGHT, HEAT, SOUND, ETC.—Electricity in the Production of Galvanic Deposits and of Chemical Decomposition.—New Investigations in the Compound Electropheling Bath, by M. Thenard —Ball Lightning. Improvement in Dynamo-electric Machines, by DIEUDONNE F. J. Lentin; 3 engravings.—The Cause of Light in Flames.—Tonometry, or the Measurements of Sound, by A. J. Ellis. An interesting and instructive paper.—Underground Telegraph Lines in Paris.

V. ASTRONOMY.—Structure and Origin of Meteorites; explaining the Interior Structure of Meteorites, the formation of Minerals and Rocks, Origin of Meteorites, Meteoric Iron, Testimony of the Microscope. An interesting paper. By H. C. SORBY, F. R. S.—The Asteroids, by Profes-sor C. A. YOUNG.

BLUE GLASS BLINDNESS.

mania affects different people. The believers in the blue the subject is thirty years of age, and that the disease is oftenglass absurdity have hitherto had a monopoly of wild theo est found among people between the ages of thirty and ries on that subject, of which they have invented no lack, forty: that certain individuals possess an alcoholic idiosynto meet the various objections raised, but here is a blue glass | crasy, a natural latent desire for stimulants which leads, if skeptic gravely making assertions fully as baseless as the indulged, tomorbid appetite and a diseased condition of the question is none other than our staid contemporary the weakness of will that led to the disease obstructs its removal. Ecening Post, of this city: which, in its anxiety to warn its These are all well demonstrated facts. Dr. Joseph Parrish readers against an apparent danger inherent in blue glass, perpetrates the following:

"That blue glass has any curative properties remains yet to be proved; but that glass of that color will concentrate the rays of the sun, in a lesser degree, as the common burning glass does, was known before General Pleasonton's book was printed and made so much of by the newspapers, Λ gentleman of Brooklyn suffering from weakness of sight was recently led by the advice of well meaning friends to use spectacles of blue glass, such as certain opticians are selling just now. The result was that his eyes, already too weak to be used much in ordinary circumstances, were exposed to a terrible glare and heat, which in less than a week entirely destroyed the eyesight of the sufferer. He is now totally blind. This is a fact, and the gentleman would doubtless be glad to have other sufferers from weak eyes know of his case and draw a moral therefrom. Another similar instance has come under our observation, a young lady being in this case the dupe of the blue glass cuthuslasts. It is in this case the dupe of the blue glass cuthus asts. It is worth bearing in mind that the only property of blue glass that has been proved is its power to concentrate the rays of the sun and produce extraordinary heat.

Neither glass stained blue nor glass of any other color "concentiates the rays of the sun as the common burning glass does." A lens, from the curvature of its surface or surfaces, has the property of causing the luminous rays which traverse it either to converge or to diverge. By a burning glass or double convex lens, parallel rays are conveyed to a focus. If blue glass is made in similar form, it will act similarly; otherwise it will not.

But, as we have repeatedly pointed out, blue glass cuts off a very large proportion of the luminous rays, and the light it transmits is nothing but modified sunlight, or rather sunlight shaded and reduced in intensity: so that, so far from blue glass producing a terrible "glare," it transmits an exceedingly mild light. This property was utilized by photographers long ago in order to relieve the eyes of their sitters; while blue spectacles have been worn by weak-eyed people almost ever since spectacles were contrived.

It is not necessary to discuss the question of whether blue glass becomes hotter through absorption than clear glass, in the absence of any authentic experiments on the subject. It is well settled that, as color teaches us nothing regarding the radiation and absorption of non-luminous licat, any conclusions as to its influence may well be wholly delusive. The absorption depends on the particular absorptive power of the coloring substance, and not on its hue. Clear glass is opaque to a considerable degree to heat rays, and therefore through absorbing them becomes warmed. The only question, then, is whether the coloring matter introduced is capable of producing increased absorption sufficient to render the glass hot, and so to cause it to injure the delicate outer portion of the eye through its proximity thereto. In the absence of any data determining this point, no positive opinion can be formed; but it seems probable that the resulting inflammation of the organ would produce suffering sufficiently intense to indicate its cause to the wearer of the glasses and induce him to discard them before the week had clapsed during which the lesion became permanently extended to the optic nerve. It should be understood, however, that, if blue glass spectacles are injurious, it is because of the constitution of the glass, and it does not necessarily follow in consequence of that glass being blue.

DRUNK OR DISEASED ?

The sciences of law and medicine are now in direct conflict on the question of the responsibility of the inebriate. The law holds a drunken person answerable for his acts, and the other hand, one of the highest medical authorities, who from the publishers to the effect that the book is regarded has made drunkenness the subject of prolonged and careful "as the best modern work on the subject." It is a small study, Dr. D. G. Dodge, late Superintendent of the New volume, and the price is eight dollars, for which sum one York State Incbriate Asylum in Binghamton, says that "in- might reasonably expect to obtain something new and valuebricty is a condition of the system exhibiting a class of able. The work is no doubt modern, but we fail to discover symptoms resulting from a long continued and excessive anything new or especially attractive in the designs. use of alcoholic stimulants, which brings the subject to a conseems to us-and the idea is one we have long held-that it dition he is too weak to overcome; and for which he is not is about time that a reform in our churchyard architecture

pleas of "emotional insanity" have secured immunity for the fixed impression that, when gravestone makers emancifull meed of punishment. Much has been written and said to bic head, they proceeded as far as the funereal urn and prove that, when a man becomes a drunkard, it is a volun- broken pillar and there stopped, a few bolder spirits only finding pleasure in their early use of stimulants; but this is built our houses like Grecian temples and indulged in other by no means true of all. Dr. Dodge tells us that, like all architectural atrocities; but at the present time, we may hereditary diseases, intemperance is transmitted from parent truthfully assert that our graveyards possess a full supply to child as much as scrofula, gout, or consumption; that it of them, and that something new would be a gratifying observes all the laws of transmitted disease; that it may even change.

skip a generation, and appear in a succeeding one with all It is curious to notice in what strange ways a popular its former activity: that the habit seldom culminates until errors which they are aimed to controvert. The skeptic in system, which the patient is powerless to relieve, because the says that he has known hereditary drunkenness developed after sixty years of sobriety. Dr. Forbes Winslow, before a British Parliamentary Committee, stated that he had observed a list of criminals in which a father was a drunkard, grandfather a drunkard, grandmother an idiot; and in the whole line the family showed drunkards, criminals, and idiots. All the forms of vice were hereditarily transmitted.

> The difficulty at once suggests itself of how to distinguish between the man who gets drunk because he cannot help it and then sins, and him who deliberately becomes intoxicated. If we place the drunkard on the same level as the lunatic in regard to irresponsibility for crime, we find ourselves brought face to face with a host of perplexing questions. A man cannot sham lunacy without being reasonably sure of detection; but he can get genuinely drunk, and still have faculties clear enough to execute a purpose of revenge, for example. Neither law nor medicine can positively say how drunk a man must be to be irresponsible. Neither can we unearth every one's genealogy to find out whether his grandfather was an inebriate in order to predicate the hereditary hypothesis. It is evident, therefore, that the drunkard-no matter how he became a victim-must be placed in a different category from the lunatic and the criminal who commits crime automatically. Λ lunatic is never responsible, society must regard a criminal as always so; but the responsibility of the inebriate depends on a host of circumstances, which may differ in countless instances. It is obviously as much an error to regard every drunkard as an automaton impelled by irresistible impulse as it is to consider him-as we now practically do-a fully reflecting being. The problem is to find the just mean which will cover all cases, or to discover a mode of prevention which will simplify the general con-

> The preventive remedies which have suggested themselves are two: First, the inebriate asylum; second, the repression of the liquor traffic. The inebriate asylum, though really a curative institution, is in the end the means of preventing the spread of inebriation by hereditary transmission. Intemperance is curable, just as insanity is, in most cases; and, to a certain extent, similar means are used to effect the desired result. The treatment, however, involves skill and thorough acquaintance with the disease in all its forms; and it is therefore of a nature which is best practised in special institutions. The increase in number of the latter may therefore be considered advantageous. As regards the checking of the liquor traffic, there is ground for much argument pro and con. A step in advance which might be taken, and its results tested before resorting to prohibition, is the stringent enforcement of enactments against adulterated liquors. Whiskey-or rather a vile decoction of fusel oil-is sold in the slums of this city, at retail, at prices less than the government tariff alone amounts to. Repression of adulteration would break up the sale, and place liquor out of the pecuniary reach of thousands of people who are now easily able to gratify their desires. Pure liquors, say authorities, are worse as a source of inebriation than the adulterated ones, owing to the greater proportion of alcohol present. This is doubtless true; but at the present time the immense preponderance of liquor sold is adulterated. Enforce the laws to prevent the sale of that, and maintain a high tariff on pure liquors, and it will become an expensive proceeding to get irresponsibly drunk.

ABOUT GRAVESTONES.

We have just received a volume containing seventy-four refuses to accept intoxication as a plea in extenuation. On lithographed designs for gravestones, accompanied by a note responsible." Society, it would seem, stands in a dilemma was set afoot. We have got into a rut, so to speak, of defrom which it is difficult to perceive any present way of signs which have been the same from the period "whereof the memory of man runneth not to the contrary." The The question is one, however, which demands speedy settle- visitor to the country churchyard, or our magnificent Greenment, for laws are indeed anomalous under which fine-drawn wood, finds them at every turn; and he may depart with wilful murder, while the wretch who deals a fatal blow pated themselves from slabs and tables, the sole decoration while crazed and diseased with drink is subjected to the of which was the occasional hourglass or impossible cherutary proceeding on his part. This is the legal view-or advancing to the further point of crouching lambs and rather, the legal fiction-relative to the subject. There is no kneeling angels. Now, these ideas are well enough in their doubt that many do become confirmed inebriates through way, or rather they were so, say fifty years ago, when we