Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 87 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN. \$3 20 One copy, one year, postage included... One copy, six months, postage included.....

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 ame proportionate rate. Postage prepaid

The cientific 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 ParkRow, N. Y.

Subscriptions received and single copies of either paper sold by all the news agents.

VOL. XXXVI., No. 4. [New Series.] Thirty-second Year.

NEW YORK, SATURDAY, JANUARY 27, 1877.

Contents.

(Illustrated articles are marked with an asterisk.)		
Air for combustion (5). A nerican railways, an editor on. A nimation in vegetables, etc A nswers to correspondents. Axle box, self-olling * Barometer indications (16). Basilica of St. Peter's, Rome*. Boiler grate difficulty (6). Beiler, tubular safety * Bridge, New York and Brooklyn Business and personal. Business and personal. Business men, etc. Carpet stretcher*. Carriage woodwork, heat and. Castings, shrinkage of (8). Color ghests. Dredging machine, a new*. Electro-plating (15). Engine power, etc. (9). Engine for boats (11). Fermentation, checking (10). Fernentation, checking (10). Fire, extinguishing. Firchose, etc. testing. France, Mediterranean coast of.	5205549555749560652055555555555555555555555555555555	Ink for stamping on tin (3). Inventions patented in England tronclad Duillo, the *. Kaoin Laceard other fabrics, inishing. Lamp chimneys, blue. Lead Poison in sewing silk Leather belts, weight of. Manometer, the (1). Medical art, tendency of the. Milk sigar, mannfucture of. New books and publications. Patent decisions, recent Patents, American and foreign Patents, efficial lists of. Petroleum supply, decrease of the Rivets and riveting tools* Rivets, distance of. Rome, St. Peter's, etc.* Salt, Sir Titus, and Saltaire. Screw-cutting tools* Steam carriage, a new* St. Peter's, Rome* Sulphate of iron, white (17). Telegraph magnets, winding (13)
France, Mediterranean coast of Fruit trees, winter dressing	56 56	Telegraph magnets, winding (13) ! Telegraph, size of the Atlantic. !
Gold mining in China	59 51	Tetrachleride of carbon (14)
Gun, an old magazine Hair, the human	59 50	Varnish, copal (12)
Heart, the action of the *	51	Waterpreofing cetton repe (4)
Hunting ground, a new Ideation in utero	49 48	Wedge keys, angle of
Illumination, new source of Inebriety as a disease	56	Whitewash your shops

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT, No. 56.

For the Week ending January 27, 1877.

- -MECHANICS AND ENGINEERING,-Extension of the Metropolitan Underground Railway, London, with 1 engraving, containing view of the Exterior and Interior of the new Aldgate Station.—Iron Shatting, relativestrength, cold rolled.—Increase of strength of iron by rest.—Ancient Roman Aqueducts.-The Candelaria Mine.-New Road Locomotive, 1 engraving.—The New Steam Yacht Gitana, the fastest yacht in the world, dimensions and particulars, with description and 1 engraving .- The Worthington Pumping Engine, with description and 1 engraying.-Fitting Keys and Keyways, by JOSHUA ROSE. A valuable and practical paper. - Army Flying Machines, as tried at Chatham, England, by Government officers.-New Submarine Rock Drill, 1 engraving.-The Relative Value of Blows and Pressure.
- II.-LESSONS IN MECHANICAL DRAWING. By Professor MACCORD. New Series No. 3. With 9 illustrations.

 III.—TECHNOLOGY.—New Intermittent Filter, 1 figure.—Architectural
- Science. Effect of position of the parts in a frame or truss.—The most economical mode of cutting a beam from a log.—Proportions of the strongest beam, from a given log. Roof for span of 30 feet without direct tie, with 1 figure. Best means of framing without ties. Oldexamples of framing.—The Grindstone of the Sixteenth Century, with 1 figure.—Ostriches and Ostrich Farming.—The Chemistry of Coal, by
- IV. ELECTRICITY, LIGHT, HEAT, SOUND, ETC.—On the Minute Measurements of Modern Science, by Alfred M. Mayer. Being the first of a series of papers, with details of interesting practical experiments concerning the measurements of length, angles, area, volume, weight, and time. The present paper describes the methods employed for the accurate determination of the lengths of the waves of ether, and forms a most interesting and valuable confribution.—Sensitiveness of the Ear to changes of Pitch in Music, by A. J. ELLIS .- The Phelps Electro-Motor Telegraph Instrument, with 3 engravings descriptive of the electric engine for giving the rotary motion.—Electrical Statical Repulnh Dial _The scope.—Heat from Electricity.—The Electric Range Finder.—Magnetic Capacity of Iron and Steel.
- V.—ASTRONOMY.—Cause of the Scintillation of the Stars.—On the Variations of Gravity.—Transit of Venusin 1882.—Meteors, when most frequent.—Change of Color in Stars.—Effect of Sun-spots on Climate.— Recent Spectroscopic Results.—Meteoric Stones.
- VI.-MEDICINE, HYGIENE, ETC.-Spiritualism, by Dr. W.B. CARPENTER. Sanitary Hospital Appliances.—Diseases Germinated in Hospitals.— Cure of Port Wine Marks. - Remedy for Palpitation of Heart. - Causes of Stone.—Lester's System.—Lesion of Brain.—St. Francis' Hospital; Notes of Practice, by G. M. Edebolls, M.D.—Clinical Study of Diptheria.-Detection of Magenta in Wine.

Terms:—Scientific American Supplement, one year, postpaid, fire dollars. One copy of Scientific American and one copy of Scientific American Supplement, one year, postpaid, sven dollars. CLUBS.—One extracopy of the Supplement will be supplied gratis for every club of five Supplement subscribers at \$5.00 each.

All the back numbers of the SUPPLEMENT, from the commencement, January 1, 1876, can be had. Price 10 cents each.

uary 1, 1876, can be had. Price 10 cents each.

NOW READY.—The SCIENTIFIC AMERICAN SUPPLEMENT for 1876. Complete in two large volumes. Over 800 quarte pages; over 2,000 engravings. Embracing History of the Centennial Exhibition. New Illustrated instructions in Mechanical Drawings. Many valuable pagers, etc. Price five dollars for the two volumes, stitched in paper; or six dollars and fifty cents, handsomely bound in stiff covers.

Remit by postal order. Address

MUNN & CO., PUBLISHERS, 37 ParkRow, New York.

 ${\mathbb F}^{pr}$ Single copies of any desired number of the Supplement sent to any address on receipt of 10 cents.

THE MODERN TENDENCY OF THE MEDICAL ART.

In regard to the manner of conducting a thorough diagof Physicians and Surgeons, to make an appropriate comparison, likening the process to hunting up a thief known to be hidden somewhere in a large house. In place of running about, without system or plan, and looking carelessly about, the proper course is to submit each apartment of the house to a thorough and exhausting search, looking in all closets and recesses: and when sure that the thief is not in any particular room, the apartment should be closed, and the search commenced in another. So, in making a medical diagnosis, the beating of the heart; then the respirations may be counted, up, say, for instance, the nervous system: beginning with skillful and acute physician is sure to find the disease, if it is not an imaginary one; even if the latter be the case, it is a mer Granville. disease of the mind, and has to be treated accordingly, somecine for the body, each being adapted to the character of the portions of the brain are so active as to produce concerted

This way of searching for a disease is eminently practical; a disease is like a thief or an enemy, trying to take possession of certain organs, and who must be driven out by drugs. In ancient times, many human ailments were actually attributed to personified evil beings, who could be driven out by incantations or ceremonies, and we find this belief still prevailing among certain races of savages; and we regret to say, even among certain classes of our civilized and enlightened peoples, there are some who believe in charms, and in magnetic and mesmeric manipulations. But, thanks to the light shed by recent thorough investigations in two important branches of biology, namely, physiology and pathology, more correct views now prevail among all educated physicians: and they now know that diseases are mere phenemena, proceeding from the constant and intimate relations of man with surrounding Nature; and in place of attempt-Nature, he assists her efforts to save the sufferer. This is the true basis of modern enlightened medical treatment.

This rational way of considering a case shows also how ing on variously constituted individuals, will produce widely, the mysterics of heredity. different symptoms. Thus, for instance, when a regiment of soldiers happens to become exposed to excessive cold and wet, a certain number will be laid up in hospital, but they benefit as rest and careful, good nursing.

olden times, so far as such figures can be obtained, it is en- in this last aspect that we propose to consider the assertion, couraging to find that, at the present day, the mortality of quoted from a daily journal, that "intemperance is a growing large cities, such as London and Paris, has enormously de-vice, bearing constantly heavier upon the rising generation, creased, and many diseases which were once very fatal are no and incidentally the subject of inebriety generally in this longer so. The decreased mortality is due to modern progress in hygienic science, which has led to sanitary measures being adopted in such cities, where formerly people lived before the American Association for the Cure of Inebriates, under the constant influence of an atmosphere full of effete an address on the "causes of the recent increase of inebriety exhalations, due to imperfect drainage and the absence of in America," in which he embodies many of the conclusions cleanliness, a real hotbed of contagion. These sanitary im- which medical men have reached relative to the disease sudiseases, such as the plague and scurvy, which used to be disease of the nervous system, and should be treated on the always present, more or less, in many communities, and fre-same principle as other nervous diseases. It becomes classed, quently spread and traveled to others. Small pox, of which therefore, with dyspepsia and neuralgia; and like neurosis, the ravages were such that at present it is difficult to form it possesses periodicity, and—the fact is a startling one—is any idea of its former malignity and universality, has, thanks hereditary. When hereditary, it is all the harder to combat; to Jenner's discovery, become comparatively rare; while in conformity with the laws of inheritance, it may take the other diseases, such as spotted fever, dysentery, fever and place of other disorders, or may, in turn, lead to them; and ague, etc., from which many persons formerly died, have it often conduces to various forms of insanity. The periodlost their fatal virulence, and now are seldom the cause of icity of the desire for liquor, the feeling which impels the death

career, and is aiding the introduction of sanitary measures than mere reference. by enlightening public authorities as to the best means of | It is a curious and somewhat paradoxical circumstance that, preserving the health of communities by anticipating and while drunkenness as a vice—public opinion to the contrary preventing disease; and it cannot be denied that society in notwithstanding-is actually decreasing, the disease of ingeneral has been largely benefited by the progress of medical chriety is on the increase. "There never was a time," says Dr. research, and by the labors of investigators in pathology and Beard, "in the history of our race, when in proportion to the its kindred sciences, who have given the world the benefit of population there was so little intemperance and so little drinktheir continually increasing knowledge and insight into the ing among the higher classes as to-day." The nervous sys-

IDEATION IN UTERO.

It is admitted by all physiologists that the mother exerts a nosis of an impaired human constitution, Dr. Willard Parker, general formative control over the fectus in utero. Hitherto of this city used, in his lectures to the students of the College, the belief has been that this influence is altogether structural, even where it is manifested, not merely in physical resemblance, but also in active tendencies, disposition, and modes of thought and action. But there are manifestations of maternal influence which this hypothesis does not easily cover: for example, those strange, yet well authenticated, cases in which children have described or recognized places which they have never seen before, but with which the mother is familiar. Still more unaccountable has been the common and perplexing feeling which poets and speculative thinkers first thing would be, for instance, to inquire into and examine have held to constitute subjective evidence of previous exthe circulation of the blood, count the pulse, listen to the istence—the feeling that a particular occurrence or locality witnessed or visited for the first time has been seen beforethe lungs sounded by percussion and auscultation, etc. All or the sensation that some particular act in the drama of these may be normal, and then the digestion may be inves- life is but the repetition of something witnessed or performed tigated; then the various organs of secretion, especially the in some unremembered state or period in the past. In liver; and if these are all found to be in working order, they many cases these sensations are, no doubt, vague reminismay be considered as disposed of, and another section taken cences of dreams or equally unreal creations of the waking imagination: still, after this allowance is made, there remain the brain, then the spine, the sympathetic nerves, etc. In instances which cannot be so accounted for. For these the proceeding in this or a similarly systematic manner, the most satisfactory explanation yet offered is furnished by a suggestion made in the Lancet, the other day, by Dr. Morti-

It is well known that, for several weeks before birth, the times merely with advice for the mind, sometimes with medi- vital organs are all in more or less full operation; also that muscular contractions and automatic movements; and there is no reason to suppose that the intimately related cerebrum but it must not be considered to be based on the old idea that is not likewise, to some extent, capable of action previous to birth. At any rate Dr. Granville contends, and with a good show of evidence, that, during at least six weeks or two months of the ordinary period of human life in utero, the brain is susceptible of passive ideation, or the reception of impressed ideas derived from the mother's mind.

There is abundant evidence that a lively though fleeting impression made on the mind of the pregnant mother, or a prolonged dominant thought or emotion, can so modify the nutrition of the child's brain as to fix on it a permanent shadow, so to speak, of that impression or mental state. Thus a child will in after years exhibit tokens of special dislike or dread of a particular animal by which the mother has been frightened during the later months of pregnancy, or will have an otherwise unaccountable antipathy to a particular person or article of food, or will unconsciously ing to suppress such symptoms by the use of dangerous pre-immic through life the mother's moods or prevailing states scriptions, the properly qualified physician, knowing that of mind or temper during that critical period. In like manevery disease and symptom has a certain cause and must run ner, it is suggested that scenes or occurrences, deeply ena certain course, watches carefully, and, recognizing the all-graved or repeatedly forced upon the mind of the mother, powerful vis medicatrix nature, in place of interfering with may become fixed as images in the feetal brain, while it is yet incapable of thinking; and in later years, when they are vaguely recalled by something similar, an undefinable sense of repetition is felt. Memory, like education, thus has its absurd are the claims put forth on behalf of so-called specific beginning back of birth; and as the mother's structural and remedies and the danger of treating with such nostrums the emotional characteristics are echoed in the child, so somemere exterior symptoms, which may proceed from one of times her special thoughts and ideas may be. The suggesmany different causes; and conversely, the same cause, act- tion is a fertile one, and furnishes a clue to more than one of

INEBRIETY AS A DISEASE.

Ethically, there is but one view to take of inebriety; and will be afflicted with a variety of ailments. Those who are that necessarily involves unsparing condemnation of the troubled with weak lungs will exhibit such diseases as bron- practice, and earnest endeavors on the part of society to rechitis, cough, pleurisy, pneumonia, etc.; others will have claim those addicted to it. But Science, on the other hand, merely colds in their heads, others rheumatism or even gout, draws a broad distinction between drunkenness as a vice and according to their previous manner of living; in others the drunkenness as a disease. The man who drinks for pleasure, digestive organs will be affected, producing diarrhea, etc. it holds, may look for benefit in the counsels of others or in In most of these cases, drugs cannot possibly be of as much his own strength of will; but he who drinks because he cannot help it, being led by an irresistible impulse, is a sick man, In considering the statistics of diseases and mortality in and needs not a temperance pledge but a physician. It is

Dr. George M. Beard, of this city, not long since delivered, ovements have resulted in the total disappearance of many perinduced by alcohol. Inebriety he holds to be a functional drunkard who has abstained for a certain period to enter Medical science is now upon a new, unselfish, and noble upon a "prolonged spree," is too well known to need more

nature of the ailments to which human nature is subject. tems of Americans are now such that we cannot bear alcohol