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.

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.

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, uniform in size with Scientific American. Terms of subscription for Supplement, \$5.00a 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. By 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 all commercial places throughout the world. Address MUNN &

NEW YORK, SATURDAY, MAY 21, 1881.

Contents.

(Illustrated articles are marked with an asterisk.)

Aniline black ink (31)	3
Aphis, a new species of	3
Atoms, electricity of	ì
Bitter substances developed	3
Bridge, bet. N. Y. and Bkin. *319.	ŝ
Buffalo, 100,000 killed last winter.	1
Calcium light (33)	3
Calcium light (33)	į
Car cooler, novel*	á
Coca	ś
Corn as fuel	
Cylinder, monster, a	í
Dark day, the, in Canada	í
Decorative printing, process of	ί
Engineering inventions 5	₹
Filter pump, simple* Flower trade, spring	ί
Flower trade spring	ż
Flower trade, spring	á
Gamgee perpetual motion	ί
Gamgee zeromotor	i
Glass to drill (30)	ŝ
Glass, to drill (30)	á
Housekeepers, suggestion to	į
Humanity versus fanaticism	ί
Industrial correts	ć
Industrial secrets	ί
Inventions engineering	ί
Inventions miscellaneous	ί
Inventions, engineering Inventions, miscellaneous Lemurvari, the*	ά
Locomotives, large	ğ
TOCOLION 162' 100 BG	,

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 281,

For the Week ending May 21, 1881.

Price 10 cents. For sale by all newsdealers,

I	ENGINEERING AND MECHANICS.—The Denverand RioGrande Railway. 1 map. Machine for Repairing Railway Locomotives. 2 figures.—Appa-	4476
	ratus for boring locomotive cylinders in place.—Apparatus for	
	dressing locomotive valve seats. Professor Gamgee's New Motor.—The ammonia engine.—Specifications and drawings of U. S. patent.—5 figures.—Professor New-	4477
	comb's opinion of the "zeromotor."-Professor Gamgee's reply to Professor Newcomb.	447
	Celerity of the New York Fire Department. 1 figure.—Plan of modern engine house of the New York Fire Department	

II. TECHNOLOGY AND CHEMISTRY.—Stray Notes on Gelatine

Choral Hydrate and Camphor

III. ELECTRICITY, LIGHT, HEAT. SOUND, ETC.—Upon the Production of Sound by Radiant Energy. By ALEXANDER GRAHAM BELL. Recent paper before the National Academy of Sciences. 14 figures. Apparatus and experiments illustrating Mr. Bell's latest investigations of the action of radiant energy upon solids, liquids, and gases.—Observations upon the sonorous effects produce sonorous effects,.

The Gower-Bell Telephone.

Molecular Electro-Magnetic Induction. 3 figures.

Gray's Harmonic Telegraph System. 3 figures. The vibrator.—Receiving apparatus.—Sending apparatus.

Magneto-Electro Induction. By F. GUTHRIF and C. V. BOYS.

The Lime Light. By T. FREDERICK HARDWICK.

HUMANITY VERSUS FANATICISM.

When the gentle Cowper declared he would not hold upon his list of friends him who would "needlessly set foot upon a worm," the poet's humanity touched high water mark, but stopped short of fanaticism. The fanatic would have left out the word needlessly.

The distinction between wanton cruelty and the infliction of pain for humanity's sake is an important one; and in refusing to make it the Society for the Prevention of Cruelty to Animals, more recently styled Humane Society, certainly people represented by the poet.

Good intentions cover a multitude of sins, and command respectful consideration even where they do not give proof of wisdom; nevertheless, it is difficult to be patient with those who persistently prostitute the word humanity to justify courses which do not tend to ameliorate the condition either of beasts or men, collectively or individually, but rather bar the way to such amelioration. The tender mercies of the foolish, like those of the wicked, are often cruel; and of such a nature are those displayed by the officers of the society referred to when they seek by exaggeration and misrepresentation to stop all use of living animals for the scientific advancement of physiology and medicine. And it shows a pitiful state of popular intelligence, feeling, and judgment when legislatures can be persuaded by fanatics to pass laws making it a crime to pursue a line of scientific investigation which has been more fruitful than any other in knowledge helpful for the prevention and cure of disease. Pasteur's recent brilliant and most promising discoveries in connection with chicken cholera were no doubt made at the cost of considerable discomfort to a small number of guinea pigs, rabbits, and barn-yard fowls; but the certain issue of those discoveries must be to prevent an incalculable amount of distressing and fatal disease among these animals, with a possible issue of infinite value to humanity in furnishing a clew to a right understanding and treatment of many of man's

If the anti-scientific spirit of those who assume to be the official advocates of "humanity" shall prevail, all such investigations must become crimes to be prevented by the strong arm of the law, and men and animals may go on for ever dying of diseases which knowledge might mitigate or entirely prevent. That this spirit has already largely perverted a movement for the prevention of cruelty to animals into one which arrests the labors of those who would do most for the alleviation of pain in animals and in human kind, is only too plainly shown in the recent letter from a committee of the Medical Society of this State to the officers and members of the Humane Society, begging them not to interfere in certain proposed investigations touching the origin and prevalence of diseases among animals.

The letter, which is signed by nine of the best known and most honorable physicians of New York, says, after, referring to the diseases mentioned and their disastrous effects:

"So weighty are these interests that the Medical Society of the State of New York has appointed the undersigned a special committee on the subject of experimental medicine, ${\bf charge} \, {\bf d} \, \, {\bf with} \, \, {\bf the} \, \, {\bf duty} \, {\bf of} \, \, {\bf protecting} \, {\bf such} \, {\bf investigations} \, {\bf from} \,$ harmful interference.

"Such an interference is threatened by the efforts which have been made, in the name and with the implied sanction of your society, to prevent, by legal enactment, experiments on animals for medical and scientific purposes. Should these efforts succeed, they would have the effect to prohibit, within this State, a most useful means of investigation, and would be a lasting detriment to the cultivation and improvement of medicine. The committee can say, from their own knowledge, that the experiments in question are not performed in a spirit of wanton cruelty, nor in such a way as to inflict needless sufferings upon the animals employed; and thatthe information acquired by their means is often of the highest value for the protection of life and property.

"With you, we earnestly desire to prevent every form of unnecessary suffering. But we would most strongly draw your attention to the radical difference between the infliction of wanton cruelty and the serious and careful use of the

INTOLERANCE AMONG PHYSICIANS.

The unended, but we trust not endless question of professional recognition among the diverse schools of medical opinion and practice, has been brought once more into un late Earl of Beaconsfield.

Because the physician first in charge was nominally save the corn for its more legitimate use as food. attached to a school of practice not accounted regular by those who arrogate to themselves the sole right to be so designated, the ordinary courtesies of the profession were refused him, and condemnation was urged against an associate for either soft or hard coal, and is an especially good fuel who had the courage to be a trifle more courteous than the for cooking stoves. Moreover, the cost of growing corn in

It is a pity that physicians cannot more generally rise above the traditional code of their craft in their professional consideration of this question, and look at the matter for a moment with the layman's unprejudiced eyes.

Were this done we are quite sure that there would be an end to the spirit of professional intolerance which so frequently comes in to embitter the intercourse or non-intercourse of physicians, to the hinderance of real progress in medicine and the lowering of the moral if not the professional standing of physicians in the estimation of intelligent laymen. Indo not ally themselves with the class of kindly and sensible dividually the majority of physicians recognize the present emptiness of the shibboleths of medical generations dead and gone. Years ago they meant a systematic abiding by this, that, or the other theory of medical practice; and A could not consistently consult with B or C, because they knew no common ground of theory or practice to agree upon. Their remedies being always different and their methods systematically opposed, there was at least a shadow of a reason for keeping professionally aloof. But knowledge comes though wisdom lingers, and sensible men in all the medical schools have learned the vital truths that all the schools possessed some truth and a great deal of error. The hard and fast lines of theory and practice have been abandoned by all; yet the medical codes are as intolerant as ever. In this, as in all cases, men in organized society prove to be more conservative, more bound by tradition and custom, than the individuals who make up the society.

In the Beaconsfield case the intensely conservative medical societies of London show, though unconsciously, the influence of the times. Formerly the reason for non-recognition would have been bold and clear: "The obnoxious physician is not of our school; therefore his practice is all wrong, and we can have nothing to do with the case so long as he is retained." That excuse could no longer be given, since it had practically lost all its original force. So the ground was shifted, and the reason for non-intercourse was said to be moral, not professional. "The offending physician's practice is eclectic, like our own," the regulars said, "but he is saling under false colors. In deference to the prejudices of the ignorant he professes to be a disciple of Hahnemann, when he is not. Hahnemann has no genuine followers nowadays. We cannot consult with a man who is a professional cheat, however reasonable his medical practice may be, or however admirable he may be in his private, nonprofessional character."

It will not take long, we fancy, for this flimsy pretext to wear itself out. And when that is gone the grounds for fence building between medical societies of different denominations will become shadowy indeed. It is high time they were lost sight of altogether. Intolerance is pretty nearly gone out of fashion. Men in all professions are learning that any pretense of monopolizing knowledge or wisdom or sincerity of purpose on the part of any clique or school is more likely to engender contempt than respect from the world at large. Men or sets of men in no way compromise their position mentally, socially, or professionally, by treating courteously those of different mental, social, or professional standing; while they do seriously compromise their claim to popular respect by courses which indicate on their part an overweening confidence that they are radically better or wiser than any one else. In this country, at least, men are free to do right in any way or under any name that may happen to fall to them; and it lies with no exclusive schools of thought or practice, but with the best judgment of all, to decide what in any case is within or without the bounds of right. The "regular" physicians, as they delight to style themselves, take an honorable pride in saying that they are hampered by none of the theoretical or practical "pathies;" that they are scientific and scientifically free to accept and use all knowledge and all methods of practice that promise to benefit their patients. Intelligent physicians, whom the regulars style "irregular," take precisely the same ground. There are reasonable differences of opinion as to what in any case is true or expedient. And neither the regular nor the irregular heightens our respect for his opinion or practice by refusing to confer with those TECHNOLOGY AND CHEMISTRY—Stray Notes on Gelatine Flates. Sy B. BRIGHTMAN.

Handkerchief Extracts. By Robert H. Cowney, Ph.G.—List of ingredients, with prices—Recipes.—Spirits and tinctures—Orange independent of the benefit of humanity and of the brute creation; and we respectfully ask that the name and authority of your society may not be employed to the injury of the indicate.—Patchouli.—Honeysuckle.—Clove pink.—Sandalwood.—Spring flowers.—Musk.—New mown hay.—Florab bouquet.—Moss prome the emoval of Aqueous Vapor from the Atmosphere. By J. A. Orbita Ay Brutes.

On the Removal of Aqueous Vapor from the Atmosphere. By J. A. Orbita Ay Brutes. On the Removal of Aqueous Vapor from the Atmosphere. By J. A. Orbita Ay Brutes.

On the Influence of Intermittent Filtration through Sand and Spongy Iron on Animal and Vegetable Matter Dissolved in Water, and the Reduction of Nitrates by Sewage, etc.

Hydroce Brute and Careful use of the brute creation of water was the benefit of humanity and of the brute creation; and we respectfully ask that the name and authority of your society may not be employed to the injury of the medical science."

The real friends of humanity and of the brute creation was regarded as a crime rather than a virtue. The scientific and practical advances was the name of the society named with no little interest. If, as there is reason to expect, the reply is not favorable to the work proposed by the Medical Society, the friends of humanity untainted by fanaticism will wisely refrain from giving aid or encouragement to the misguided society until The Chemistry of a Lump of Glay.

New Continuous Ammonia Process. Princes and the Reduction of Nitrates by Sewage, etc.

Hydroce Brute Park and the Atmosphere and the serious and careful use of the brute creation; and careful use of the brute of the injury of the medical science."

The real friends of humanity and of the brute creation await the answer of the society named with no little interest.

If, as there is reason to expect, the reply is not favorable to whose opinions do not exactly coincide with his own. Still

food dear, have been shocked by reports from the West of settlers resorting to corn for fuel. To the sentimentalist it seems dreadful, almost sinful, that grain which might feed thousands of hungry people should be "destroyed" in that seemly prominence in connection with the treatment of the way; and we have heard some speak as though it would be almost a virtue in the Iowa farmer to freeze to death and

The Iowa State Register looks at the question in a more matter of fact and sensible way. It has tried corn as fuel, and finds that corn in the ear can be burned in stoves made Iowa is so small that it is as economical to raise corn for