Scientific	American.
MUNN & CO., Edit	tors and Proprietors.
· · —	WEEKLY AT
PUBLISHED	WEEKLY AT
PUBLISHED	
PUBLISHED	WEEKLY AT
PUBLISHED NO 87 PARK RO O. D. MUNN	WEEKLY AT
PUBLISHED NO 87 PARK RO O. D. MUNN T L: F	MEEKLY AT DW, NEW YORK, A.E. BEACH.
PUBLISHED NO 87 PARK RO O. D. MUNN The copy one year One copy, six months	WEEKLY AT OW, NEW YORK. A.E. BEACH. R.M. S.

NEW YORK, SATURDAY, SEPTEMBER 19, 1874.

Contents:

(Elustrated articles a	re marked with an asterisk.)	
Adulterations, underectable	180 Leg locomotion 181	
Alcohol, constituents of (11)	187 Liebig, a monument to	
Answers to correspondents	187 Lightning & wire connections (19) 187	
Apples, what makes them rot?	177 Locomotive, speed of (17) 187	
A'mosphere and so ar rays, the	177 Locusts, utilizing (8)	
Austro-arc ic exploration	184 Lyes utilization of waste 184	
Baoj , preservinga (5)	187 Metals, transmutation of 184	
Barometers aud temperature (12).	18î Mirrors, making silvered 177	
Barometers, itving	176 Muscarin. 177 187 Nickel mines in Australia 180	
Battery curren's 2)	187 NICKEI MIDES IN AUSTRINS 180	
Bells, power Uy (13)	187 Oderl. ss excavating apparatus 175	
Buture product produce in (15)	187 Peroffluic acid	
Dollere, unequal pressure in (25)	175 Patents, American and foreign 185	
DOICKUW, MI. M. W. F	178 Patents, list of Canadian 189	
Duge	183 Patents, official list of	
Burnt st. sl to restore	180, Phenic sold for wood	
Business and hersonal	187 Pigeons, carrier 181	
But er, harden be and coloring (6)	187 Pigeons, carrier	
Carbon plates for batteries (20)	 187 Plating difficulty, a (15)	
Castor oil, cold pressed (1)	187 Plumpers' carelesspess	
Contral American explorations	181 Pneumatic telegraphy	
Cnemistry, books ou (4)	187 Power on a wasking beam (16) 187	
Chickens, predatory	185 Quick as wink	
China and glass ware	182 Ratiway Atatistics	
Chord of an arc, to find the (24)	187 Rope cordage 185	
Coal cutier, a bana*	187 Rope cordage 185 178 Sait as manure 173 173 Scorptons and their venom* 178	
Combustion of powder	177 Scorpions and their venom* 178	
Dentis ry in United States-No. 1.	181 Shamp soing liquid (17) 187	
Disinfectant, a new	180 Soap, erasive 180 Sounding the Pacific	
Distance of the aun measuring"	180 Sounding the Pacific	
E'eciric iy at d c'ystalization (1).	18/1Steam pipes to boller grates (20) 18/	
Elecric machine, a mi lature (18)	187 Steel, chrome 181 178 Straighten a gun barrel, to (26) 187	
Further has been to the top (99)	100 Straighten a gun Dariel, 10 (40) 101	
Engineers Dussion international	181 Tapa scraw-cutting* (1) 187	
Kut in fore rule its	127 Talagraph wires clearing 181	
Fighting by menus of evolutives	187 Swimming with clothes on	
· Gaaliant of	185 Trees for avenues 181	
Gelatit, for molds (9)	185 Trees for avenues	
Gla-8 at 0 ching, marking (3)	187 VAD. The lake and city of	
Gun. an 80 (nu	184 Violin, to soften the cope (29) 187 180 Water hotter than bolying (17) 187	
Hardening as d tempering tools	180 Water hotter than bolying (17) 187	
Hawattans, tailure of the	183 Weapons, power of ancient 187	
Heroc Arivation	. 183' Weapone, power of ancient 177	
Household hists	182 Webster, Laniel, statue to 185	
Hundred and twenty years old, a	184 Wheel, d ad point in a (14) 187	
Hy traulic bumps, power of (21)	187 Woman without bones, a 176	
Ice, the coldest (17)	187 wood a costly material 183	
Ind pet de neta, the trigate*	183 wooden linings to wheel tyres (27) 187	
fron industry, the Cleveland*	163 WORME, flesh (5)	
Lawn and pleasure grounds	167 wood a costly material 188 wood a costly material 188 wood a costly material 188 wood a costly material 188 Trainer de show a cost for the show a cost 187 Line white, to restore 184	
Leau talk, Hilling a	tonzine white, to restore	

ASSOCIATION. A most remarkable speech from a most remarkable man.

PROFASSOR TYNDALL'S ADDRESS BEFORE THE BRITISH

Masterly in thought, profound in learning, keen in logic, it is startling in the boldness and vigor with which its author declares his faith in a materialistic doctrine and in the hardihood with which, asserting that forms of religious opinion have ever impeded Science, he claims for the latter unrestricted rights of research, while relegating the former to the sphere of the emotions. Such is Professor Tyndall's address delivered at the recent session of the British Associa tion for the Advancement of Science at Belfast; and its ut terances, if we mistake not, will arouse as acrimonious debate and call upon the head of the author as fierce denunciation as did the publication of his famous opinions on the " prayer gage." The time and place incident to the delivery of the discourse give to it additional weight; for in addition to its being the personal views to which he, as an eminent scientist, has been led by lifelong thought and study, it is an ex cathedra pronouncement of the President of the greatest and most influential of British scientific associations, which, anless distinctly repudiated, renders that body, in the eyes of the world at least, more or less responsible for its pro mulgation.

To understand the position which Professor Tyndall has taken in this sudden invasion of the neutral territory lying between scientific and religious thought, the reader finds himself called upon to reconcile views which at first sight appear at wide variance. "Abandoning all disguise," says the speaker," the confession that I feel bound to make before you is that I prolong the vision backward across the boundary of the experimental evidence, and discern, in that Matter which we in our ignorance, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and potency of every form and quality of life."

This, standing alone, is unquestionably the most open ma-

In thus noting the views of a distinguished thinker, we chronicle an event of no common importance: albeit it is one of which the wisdom will be widely questioned, and the expedience (of directly bringing into popular controversy thoughts likely to disturb the faith of many) denied, even by believers. It must not be lost sight of that the large majority of people never think, but receive the faith of their ancestors unquestioningly; others are incapable of thinking for themselves, others too indolent and careless regarding the whole subject. These have regarded the agitations of the great theories of evolution and the like, which have deeply moved the scientific world, with indifference, and classed them with the older doctrines of Comte, Spinoza, and similar writers, which they abhor as atheistical and subversive of all religion and piety. On such people, the unmistakable utterances of Tyndall, dispersed broadcast by the public journals and not buried in technical publications, must have their effect; but whether the seed thus sown will fall on good ground and produce broader, wider ideas of the ineffable greatness of the Creator, or be choked by the tares of a belief undermined, resulting in skepticism and infidelity is a question which every individual must answer according to his own conscience.

•••• A WOMAN WITHOUT BONES.

The social developments across the water show a lamenta ble state of affairs due apparently to no other cause than a deficiency of backbone in one or two individuals.

When such disastrous consequences proceed from the weakening of a part only of the human framework, we sincerely trust that there may be no spreading of the disease lately developed across the ocean in the person of an Irish woman, who lived to see her entire skeleton waste away until it was but a fourth part as heavy as a new born babe.

The case occurred in Dublin, and may truly be called extraordinary. The victim, forty-five years old, was a patient in an insane asylum. For five years she was confined to her bed, complaining of no pain, but gradually becoming weaker, while dwindling in stature until she lost half her hight.

As the disease progressed, her limbs were coiled up in every possible shape, the bones becoming extremely light, soft, fragile, and atrophied in every respect. At death, all that was left of her skeleton, including the skull, weighed two pounds and a half. The number of fractures was prodigious. The ribs were in a hundred fragments. The head of the humerus was bent; the fibulæ were curved; the thigh bones and pelvis were huddled together; the bones of the vertebræ were thinned and worn away across the front of their bodies; the lower jaw was atrophied and broken into three pieces the base of the skull was cribiform all through. Had she lived a little longer, it was thought that not a vestige of a bone would have been left in her body. What ailed her no one could tell, the disease being almost unheard of and difficult to diagnose, treat, or even name. Professor R. W. Smith, of Dublin University, who brought the case before the Pathological Faculty, looked upon the condition of the bones not as a disease but as a manifestation of a diseased condition as yet unknown, possibly related to rickets.

LIVING BAROMETERS.

That is a curious instinct which a large number of animals possess, of predicting the weather and signifying the approaching change by peculiar movements or sounds. Some of their actions in this respect appear to be more gov erned by reason than by mere instinct, others are clearly due to the moisture in the air or various atmospheric influences. while some, which occur under conditions which prevent their being referred to the latter cause, offer an interesting field for the investigations of the naturalist. The presence of the barometer in almost every farmhouse, together with the weather bulletin or the dictum of "Old Probabilities," good for the next twenty four hours, render such homely knowledge as that which governed the labors of the farmers and sailors of the last century almost superfluous in this advanced age; but the subject, like all topics which relate to the sagacity of the lower animals, is of itself an interesting one. And besides, it is not entirely impossible that some farm er to whom the barometer, if he had one, would be incomprehensible, and whose location prevents his obtaining the weather reports, may, by some odd action of his own cattle, of some insect, or of some bird, as described in the follow ing lines, be forewarned of a coming storm in time, and save perhaps a crop during the present harvest months.

We have said that certain movements on the part of the animals, before a change of weather, appeared to indicate a reasoning faculty. Such seems to be the case with the com-

woodpecker lamenting, by parroquets babbling, by pintados perching, and by geese running around uneasily. So also it is said that, when a storm is at hand, swine will carry hay and straw to hiding places, oxen will lick themselves the wrong way of the hair, sheep will bleat and skip about, hogs turned out in the woods will come home grunting and squealing, colts will rub their backs against the ground, crows will gather in crowds, crickets will sing more loudly, flies come into the house, frogs croak and change color to a dingier hue, dogs cat grass, and rooks soar like hawks.

It is probable that many of these actions are due to actual uneasiness, similar to that which all who are troubled with corns or rheumatism experience before a storm, and are caused both by the variation in barometric pressure and the changes in the electrical condition of the atmosphere.

PLUMBERS' CARELESSNESS.

The Prince Consort of England was killed by typhoid fever generated by foul sewer gases, due to carelessness and ignorance in the plumbing work of his residence. The Prince of Wales nearly lost his life through the same insidious means, due to the same inexcusable cause. One of the grandest and most venerable of English cathedrals, that of Canterbury, was badly injured and nearly destroyed through sparks from a carelessly managed plumber's furnace ignit. ing the roof. The magnificent Alexandra Palace, just completed and containing works of art of immense value, quite recently fell a victim to the flames, again originating among the plumber's working apparatus. Later still, the burning of the Liverpool landing stage, the greatest floating platform in the world, is now stated to have been due to the carelessness of the plumbers employed in joining the gas pipes below the flooring. The dangerous qualities of carelessness and ignorance, which are inherent to the workman of the trade, are therefore very justly coming in for their full share of reprobation from the English journals.

"Are we to spare a prince for every step of progress, or will our plumbers learn for the future without? They burn down cathedrals and music halls with unflinching impartiality by means of a system of soldering long ago abandoned by other nations. Thinking a good 'wiped joint' the perfection of human ambition, the plumber takes a long time over it and admires it lovingly from every side before he can make up his mind to part with it. This choice production of humanskill is perhaps laid in the earth or built into a wall, and has no need of this fine art finish, but gets it, nevertheless." So says a correspondent of the English Builder. We echo his remarks with a grim sort of satisfaction, for it is not very long since we experienced one of the advantages of these lovely wiped joints, artistically molded by a bungler's paw. The completion of the work was the signal of a series of complaints (by the occupants of the building) that the water refused to run, except in a miserable little stream, from any of the faucets. Then we hired more plumbers to find out the mistakes of the first ones, and these overhauled pipes, and poked sticks and wires down them, and nosed around the cellar, and went on the roof, and ripped up the street. This was to the tune of something over a hundred dollars-still the water would not come; then the plumbers went at it again, and probably would have been struggling with wires and wrenches and spades and pincers up to the present time, had not some one suggested to look at the joints, and then the evil was found. One important wiped joint had had the solder squeezed into it so as to block up nearly the whole bore, and of course but very little water could pass through.

We hired another of the craft not long ago to look after a furnace, from every register of which horrible smells were emitted. We had a man and a helper; the duty of the latter was to hold a candle and converse with the man on appropriate and interesting topics, for which we paid him some dollars per day. This pair of worthies we turned loose in the house, with instructions to find out and eradicate the trouble. They got into the furnace, and poked brooms up into the fiues, and took off the registers and poked brooms down. Then they pulled out several pieces of flue and soldered them over again, nobody ever could divine what for. Then they upset a furnace on a heap of kindling wood and nearly burnt the house down; and finally, after some days' tinkering, brought us an astonishing bill. We paid it, supposing that the work was thoroughly performed; but on lighting the furnace, again came the odor. On making a personal investigation, the first door that we opened (that in the brick casing of the furnace, which these individuals never thought to touch) revealed the cause in the shape of a bushel of dead rats. To make matters worse, the flues, which

terialism: but its force is modified when the assertion follows that "the whole process of evolution is the manifestation of a Power absolutely inscrutable to the intellect of man. As little in our day as in the days of Job can man by searching find this Power out. Considered fundamentally, it is by the operation of an insoluble mystery that life is evolved, species differentiated, and mind unfolded, from their prepotent elements in the immeasurable past. There is, you will observe, no very rank materialism here."

There is no negation of a creative power, while the affirmation of a sustaining cause repels the notion of atheism. The challenge is hurled at the theologians, the advocates of the science of divinity, and not the simply religious whose nature impels them to the belief in and leads them to love and reverence for their Creator.

Professor Tyndall demands for Sciencefreedom of thought in every department of knowledge. He denies, in fact, the right of theology to compel us to accept in blind faith truths susceptible to the investigation of our own reasoning faculties.

mon garden spider, which, on the approach of rainy or windy weather, will be found to shorten and strengthen the supporting guys of his web, lengthening the same when the

storm is over. There is a popular superstition in England that it is unlucky for an angler to meet a single magpie; but two of the birds together are a good omen. The reason is that the birds foretell the coming of cold or stormy weather and then, instead of their searching for food for their young in pairs, one will always remain on the nest. Sea gulls predict storms by assembling on the land, as they know that the rain will bring earthworms and larvæ to the surface. This, however, is merely a search for food, and is due to the same instinct which teaches the swallow to fly high in fine weather, and skim along the ground when foul is coming. They simply follow the flies and gnats which remain in the warm strata of the air. The different tribes of wading birds always migrate before rain, likewise to hunt for food. There is a large variety of actions of which it is hardly possible to give a satisfactory explanation. Coming rain is

they had pulled out and fixed, had come to pieces, and we had to hire more plumbers to solder them with something besides rosin.

A few pages further on, in the same issue of the journal from which we clip the extract given in the beginning, is the report of the conflagration of some fine tenement houses in Edinburgh, due to a plumber's carelessness. The man left his furnace with a bright fire in it on the leads and went to dinner. A strong breeze blew it over, and the igniting of the building was the natural result.

We have no space to go over the series of outrageous botches which have been foisted upon us, coupled with enormous charges from plumbers, in this city. We have seen traps put in waterclosets, of not the slightest use in keeping down the noxious emanations. Water pipes run up the back walls instead of between the party walls, of course freezing at the first frost; new joints are made between floors, through which, the moment water was let on, the leskage poured out, to the ruin of our ceilings.

foretold by the peacock uttering frequent cries, by the I In fact so often have we been ruthlessly victimized that