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ANOTHER GREAT FIRE IN CHICAGO, AND THE MATERIALS ACCUMULATING FOR ONE IN NEW YORK.

Chicago was visited, on the 14th ult., by a second great fire, which devastated about eighteen blocks of buildings, and entailed a loss estimated in the neighborhood of two millions of dollars. Too great falling far short of the conflagration of 1871 in its disastrous effects, this visitation has been the means of rendering thousands of people homeless. Unlike its predecessor, which destroyed some of the fairest portions of the city, it was mainly confined to rookeries and dens, in the obliteration of which the community is rather the gainer; but, as is the rule in such quarters, the population was dense, and consequently the numbers deprived of shelter are greater than would be the case had other parts of the town been burned.

There is evidence of mismanagement of the fire department, to which is probably owing the non extinguishment of the fire at an earlier period. Engines were posted behind the flames instead of in their path, and attempts at blowing up buildings were miserably unsuccessful, owing to lack of powder, a state of affairs difficult to comprehend. To one good substantial fireproof building, the safety of almost the entire city is due. The blaze lapped it all around, but its marble walls stood grandly; and then, as the fire attempted to crawl over it, the flames grew weaker and were beaten back by the firemen on the other side. One honest structure was the savior of millions of property; and the builders of the metropolis may well take the fact to heart.

New York, at this moment, fairly invites the fate of Boston, Portland, and Chicago. Buildings are being run up to heights to which water by the fire engines cannot be thrown. There are wooden structures in close proximity to some of the grandest edifices; there are blocks upon blocks of tenements filled with swarms of people, the majority of whom, from poverty, use kerosene in place of gas, and in which a great fire, once started, would work terrible ravages. In our up-town streets, houses shoot up half a dozen at a time together, a mass of the thinnest possible walls and kindling wood beams and fittings, built to sell and to realize a big interest on capital, without any regard to the simplest precautions in favor of safety. We have an admirable fire department, to the prompt exertions of which our immunity thus far is mainly due; but if circumstances combine to engender a great fire, as in both cases in Chicago, it will be through the mercy of Providence, and not through our own foresight, if we escape a terrible visitation.

CHOLERA AND ITS TREATMENT.

In view of the general uneasiness which reports of apparent cases of Asiatic cholera, as they recur, will tend to engender, a little volume before us is of timely interest, inasmuch as it not only gives valuable information regarding the origin, symptoms, and nature of the disease, but also points

out, probably, the most efficacious methods for its cure. The book, which is entitled "Observations on the Pathology and Treatment of Cholera" (G. P. Putnam's Sons, New York), has been written very recently by Dr. John Murray, Inspector General of Hospitals in England, and late of Bengal; and it aims to give the result of the author's forty years' experience during a residence in a country ordinarily considered as the hotbed of the disease.

Cholera is caused, we are told, by the presence of the poison in the system, and until this is removed health cannot be regained. The first stage of the disease, malaise, is frequently unnoticed by the patient, and it may be produced by many causes independent of cholera poison, such as over-excitement, fatigue, depression from misfortune, and similar physical or mental conditions. Hence, while such symptoms, under ordinary circumstances, need excite no especial apprehension, still, if the patient has been in contact with cholera cases, or in the neighborhood of an infected region, they should be regarded as the signal of approaching danger and carefully treated. The system should be relieved, and the blood purified without causing diarrhoea.

Improper food, over fatigue, and purgative medicine, the last especially, tend to develop the second stage, which varies in duration from two or three hours to two or three days. The evacuations become watery and colorless, and the effect is to predispose to collapse. The great danger is from the purging increasing and becoming uncontrollable. The remedy which the author prescribes is composed of opium one part, black pepper two parts, and assafoetida three parts, divided into five grain pills, and given with a little cold water after every evacuation. These pills are used all over India and distributed to the troops. Astringents Dr. Murray condemns as useless, if not injurious, and he adds that chalk mixture, infusion of capsicum, camphor in alcohol, and similar compounds are not to be relied upon. It should be remembered that it is at this stage of the disease that the infection is communicated, and hence disinfectants should be freely used with the evacuations. The diet should admit of no solid food unless farinaceous, such as bread, arrowroot, and sago. Exercise in fresh air is desirable, but fatigue is dangerous.

The following stage is collapse; and as, when the disease is thus far advanced, danger is imminent, treatment becomes most difficult. It would be impossible, with the space here at our command, to follow the author through the various symptoms laid down and the remedies advised. He describes the stages generally under three heads: The first is incipient collapse, where there is a great prostration of strength; but the voluntary life of the body is active, and the involuntary life only partially suspended. The treatment here recommended is in great measure expectant, to gain time to allow Nature to eliminate the poison through the individual secretory organs. In the second or confirmed degree of collapse, voluntary life is impaired and involuntary life is flickering. The treatment advocated consists in palliative cold drinks, hypodermic saline enemata, and strong mustard poultices or blisters upon the abdomen. The addition of a small quantity of quinine to the water administered is useful, and the appearance of bile in the evacuations is the first sign of hope. In the last form of collapse, the powers of voluntary life are very low and those of involuntary life are paralyzed. The hope of recovery is very faint, and there is no remedy on which reliance can be surely placed.

Dr. Murray devotes the larger portion of his work to the consideration of collapse, and also to the discussion of the after-effects of the disease during convalescence. In referring to hospitals, he says that those best suited to the disease are small buildings on open ground, well drained, and in the vicinity of trees, if possible. Huts may be used with great advantage, and should be located in the center of the infected district. In conclusion, the necessity of deciding on the best course to pursue before an epidemic actually occurs is urged upon local health authorities, as, when the disease appears, excitement ensues, and often confusion, amounting to panic.

THE INSPECTION AND INSURANCE OF STEAM BOILERS.

The recent amendment of our State law of boiler inspection, making the certificate of inspection issued by any company authorized to insure steam boilers equivalent to an official certificate, gives occasion for more than a passing interest in the management of this department of the insurance business.

What is the basis of the business? How is the work carried on? And why should the parties engaged in it be accepted as trustworthy agents of public safety within the scope of their business operations?

In response to inquiries of this sort, the Hartford Steam Boiler Inspection and Insurance Company, the leading as well as pioneer corporation of the kind in this country, have courteously laid before us, for the information of our readers, full details as to the method, purpose, and practical results of their work.

That the use of steam power is fraught with danger is only too well known; the extent of the danger, however, as indicated by the number of explosions every year and the loss of life and property entailed, is but vaguely appreciated by the public at large. No official record is kept of such accidents, and only those of exceptional interest are reported in the newspapers; nevertheless the number so reported and brought to the notice of a single individual during the past five years is but a little short of six hundred, causing the death of 1,329 persons, and the wounding of upwards of 1,500 more! The amount of property destroyed cannot be told: any one knowing the destructive character of boiler

explosions will understand that it could not have been small.

Against losses of this character, ordinary insurance offers no indemnity, since the destroying element is neither fire nor water, though both have something to do with it. The need of a special system of insurance to cover these particular risks was early appreciated by steam users in England; in this country it remained unmet until 1866, when the company above named went into operation.

Unlike other forms of insurance, this does not undertake merely to indemnify the policy holder for losses of the special nature embraced in its plan of operation, but to prevent such losses by a watchful care of the property insured. Its tendency is therefore quite the reverse of ordinary insurance in that it lessens instead of increases the likelihood of "accident."

Boilers do not explode without cause, which cause, in the great majority of cases, may be detected in its incipiency by proper inspection, and the risk removed by timely repairs. It is in this department of its work that the company becomes an unofficial guardian of public safety: a prime condition of every policy of insurance being that the company's inspectors shall at all reasonable times have access to the property insured, and be afforded every facility for a thorough examination of the boiler and its attachments: and in case defects are discovered at any time, in any way affecting the safety of the boiler, the assured is bound to correct the evil at once, or the policy dies. Should the owner choose to assume his own risk and refuse to make the needed repairs, the company's inspector is required to notify the official inspector for the district, who alone has power to compel the disuse of the dangerous boiler if in his judgment its condemnation be just. This, however, is a purely imaginary case, no instance having thus far occurred of a policy holder slighting an inspector's suggestions, or declining to correct defects to which his attention had been called.

A brief statement of the work done by the company's thirty inspectors during the past year, with the number and kind of defects discovered and corrected, will give a rough idea of the character and usefulness of its work.

The number of inspections made was within two of twenty-five thousand, more than a third of which were thorough internal inspections, including external examinations of tubes, flues, and firesheets, internal and external of the bracing and staying, and the condition of all boiler attachments. The number of defects discovered was 11,988, of which 2,892 were regarded as dangerous, that is, of such a character that an accident was liable to occur at any moment. In 178 cases boilers were condemned outright, as so completely worn out or injured by carelessness as to be beyond repair.

In detail the defects may be classed as follows: Furnaces out of shape, with sheets contorted and buckled, 599, dangerous, 124; fractures, 1,003, dangerous, 459; burned plates, 682, dangerous, 291; blistered plates, 1,737, dangerous, 298; cases of deposits of sediment, 2,263, dangerous, 227; of incrustation or scale, 2,180, dangerous, 205; of external corrosion, 818, dangerous, 163; of internal corrosion, 333, dangerous, 92; internal grooving, 206, dangerous, 47; defective water gages, 561, dangerous, 96; defective blow out apparatus, 253, dangerous, 83; overloaded or defective safety valves, 321, dangerous, 107; defective pressure gages, 1,470, dangerous, 280, the extremes of variation from a standard gage being from minus 57 to plus 50; boilers without gages, 682, dangerous, 62; deficiency of water, 113 cases, dangerous, 69; cases of loose and broken braces and stays and insufficient bracing, 465, dangerous, 230.

Who can estimate the amount of peril to life and property obviated by the discovery and timely correction of these twelve thousand defects and deficiencies?

The fidelity and skill with which the inspections were made during this and preceding years, as well as the correctness of the theory on which they were based—a theory which gives small space to the mysterious in accounting for boiler explosions—are sufficiently attested by the almost entire absence of serious accidents in connection with the thousands of boilers of all sorts and conditions that are or have been in the company's care. In two cases only has life been lost by the explosion of such boilers, the victim in one being the driver of a locomotive, in the other the engineer in charge of a stationary boiler which exploded for some cause that baffled detection.

Of course it is impossible to say that any others would certainly have exploded if left in the condition of the uninsured and less frequently inspected: still a glance at the museum of boiler defects collected by the company's inspectors would convince the firmest believer in protecting providence that, without their intervention, nothing short of perpetual miracle could have kept some of the diseased subjects from sudden and violent ends.

Further evidence of the value of the company's inspections is given by the increasing appreciation of them by steam users. To a very large extent the inspection and approval of the Hartford Steam Boiler and Insurance Company is made a condition without which a boiler will not be accepted; while many leading boiler makers have all their work thus inspected, the company's certificate going with each boiler as a guarantee of its soundness and proper construction.

So far the business affects only boiler makers and boiler users. The late legislative enactment makes the community at large a party also, in that it practically entrusts the public safety within certain limits to the care of the insurance companies. It is but right and natural that the public should ask why and wherefore.

The amendment was passed in response to a petition very

numerously signed by the leading manufacturing firms of the State, the reason offered therefor being substantially that the conditions of insurance implied a full compliance with the spirit of the law, the sole object of which was to lessen the danger of boiler explosions, by periodic inspections and the restriction of pressure within safe limits. To this extent the object of the Hartford Steam Boiler Inspection and Insurance Company is the same. The end and aim of the law being thus attained, it was urged that the insured might, under proper restrictions, be justly and safely exempt from the charges and delays incident to official inspections. The legislature wisely saw the point and the amendment was adopted.

We say wisely, since, without impugning in the least the honesty and ability of the inspectors appointed by the government, it stands to reason that the supervision of parties having a pecuniary interest in preventing explosions, and restrained by no care for the cost of making doubtful property safe and sound, will be quite as rigid and exacting as that of the government, which assumes no such liability. Equally reasonable is it to expect that the agents of an insurance company, directly responsible in the premises, will be quite as carefully selected for integrity and special fitness for the work as the appointees of that transitory and irresponsible thing we call the government; and the inspectors so chosen will also be quite as likely to be free from corruption or favoritism in fixing the limit of pressure or in overlooking defects, the inspector's personal liability for damage by explosions being the same in one case as in the other.

We have referred incidentally to a feature of the work of the Hartford Steam Boiler Inspection and Insurance Company, which, though not a necessary element of their scheme, is one which bids fair to prove of great benefit to steam users, and consequently merits a somewhat fuller notice. It is the study the officers are making of what may be termed the pathology of steam boilers. Every application for insurance is accompanied by an inspector's report describing the boiler and its attachments in detail, and giving full particulars as to the setting and construction of the boiler, its age and maker's name, the kind of fuel used, the source and quality of the water supply, in short everything affecting in any way the durability and safety of the property. These facts are entered in a record book, and supplemented by the facts supplied by the monthly inspection reports, so that the history of every boiler with its attachments can be ascertained in a moment. In this way boilers are taken as they are used, the practices which obtain in different parts of the country are compared, the effects of different kinds of fuel and water are studied, together with the various safeguards and correctives employed; the working of different gages is observed under all sorts of circumstances, in fact all the fruits of widely extended and thoroughly systematized observation are brought to bear on the question why boilers explode, and on the practical problem of preventing explosion. It is impossible that such an accumulation of knowledge in regard to the wear and tear, the weakness and dangers of boilers, should not ultimately lead to practical results of the highest utility.

PATENT OFFICE JUSTICE.

In the matter of the interference case between H. H. Bigelow and S. W. Baldwin, before the Patent Office, the Commissioner of Patents, acting as it appears illegally, refused to permit the case to go before the Examiner in Interferences, who is the special officer designated by law for the hearing of such matters, thus preventing a final decision as to the question in dispute. Mr. Bigelow thereupon applied to the Supreme Court of the District of Columbia, for a mandamus to compel the Commissioner to do his duty. Judge Carter, after a full hearing of the case and of the excuses of the Commissioner, concluded that a mandamus must issue. The Court decided that the examiner in charge of interferences in the Patent Office is exclusively authorized by law to examine all cases of interference, whether between two pending applications for a patent or a pending application for a patent and an unexpired patent, and primarily to determine the question of priority of invention involved in either class of said applications; and that the Commissioner of Patents is bound by law to direct said examiner in charge of interferences to proceed to determine the said question of priority in invention.

Applicants for patents will necessarily be subject to delays, expenses and troubles, so long as the Patent Office, with its battalion of examining officials and assistants, four hundred in all, are permitted to act as inquisitors of inventors. Questions about the novelty of inventions and rights of priority between claimants must, under the American system, be finally decided by the courts. The only unsatisfactory part of our patent laws is that which subjects inventors to so many troubles at the Patent Office, before they can reach the courts. The Bigelow case is only one of many others. Had this applicant been a poor man, as the majority of inventors are, he probably would have been unable to lose time upon the case or spend money to pay lawyers in arguing for this mandamus; and the adverse whim of a Patent Office official would have stood as a permanent bar to his suit. What is needed is, to eliminate all such objections from the patent laws, and make it the simple duty of the Patent Office to issue a patent to every applicant who chooses to ask therefor, on presentation of suitable documents in proper form, leaving all questions relating to the validity of patents to the courts of law for settlement. This is the common practice in nearly all other countries in the world, and is found to work well. But in Prussia and the United States, the inventor is obliged to submit to the costs and annoyances of official inquests before he can obtain the patent cer-

tificate. In Prussia, the patent officials manage to interpose so many preliminary objections that nearly all applications for patents are rejected, while the government retains the money paid. In this country we grant more patents, but we nevertheless inflict upon inventors an immense amount of useless trouble, before issuing the certificate. Our Patent Office officials would consider their occupations gone and themselves of no account in the world if they were not privileged to hunt up objections to excite and harass the applicants for patents.

POLITICS IN THE BEEHIVE.

The idyllic picture of divinely appointed harmony, drawn by naturalists of the old school in describing the social economy of bees, is sadly disturbed by the prying observations of modern students. Instead of being models of industry and virtue, each and all, some of them, at least, prove to be no better than the rest of us, given to political dissensions, liable to bully royalty itself, and—tell it not to Watts—preferring theft to honest labor.

Lubbock has cast a grave doubt over their vaunted wisdom, and now Fritz Müller discovers that their virtue is as little to be depended on as that of our most pious statesmen. Happily they are not our bees that misbehave so badly, and it is only for Brazilian bees that the poet's verses will have to be amended so as to read:

How doth the naughty little bee
Improve the shining hour?
He robs his neighbor every day,
And never seeks a flower,

or something to that effect.

There is one species (*trigona liondo*), as Mr. Müller writes to Charles Darwin from the province of Santa Catharina, Brazil, which never appears to collect honey or pollen from the flowers. "It robs other species of their provisions and sometimes takes possession of their nests, killing or expelling their owners. The hives in my garden have often been invaded and two of them destroyed by these robbers; and I have seen in the forest several nests, formerly inhabited by other species, occupied by them."

Mr. Müller is making extended observations on the several species of these stingless honey bees, and expects, after a few years of study, to be able to give a tolerably complete account of them. The observations he has already reported, though briefly, give cause for expecting valuable as well as interesting results at his hands. On one occasion, for instance, he "assisted" at a curious contest well worth reporting, for the light it throws on the intellectual faculties and the political or social habits of the bees. It occurred between the queen and the worker bees in one of his hives of *trigona minim* whose peculiar custom it is to construct the cells in which the young are raised around the circumference of the two or three uppermost combs; when the cells are finished and filled with food for the grubs, the queen lays an egg in each, whereupon it is immediately shut. A set of forty-seven cells had been filled, eight on a nearly completed comb, thirty-five on the following, and four around the first cell of a new comb. "When the queen had laid eggs in all the cells of the two older combs, she went several times round their circumference (as she always does, in order to ascertain whether she has not forgotten any cell), and then prepared to retreat into the lower part of the breeding room. But as she had overlooked the four cells of the new comb, the workers ran impatiently from this part to the queen, pushing her in an odd manner with their heads, as they did also other workers they met with. In consequence the queen began again to go around on the two older combs, but as she did not find any cell wanting an egg she tried to descend; but everywhere she was pushed back by the workers. This contest lasted for a rather long while, till at last the queen escaped without having completed her work. Thus the workers knew how to advise the queen that something was as yet to be done, but they knew not how to show her where it had to be done."

Possibly the queen had some glimmering notions of royal prerogative, and did not choose to be quite so forcibly advised by her subjects, who appear to have been a turbulent lot at best, since it was in this hive that Mr. Müller found two dissenting parties among the workers quarreling about the construction of the combs, and even going so far as to destroy each other's work.

THE LOCUST IN MINNESOTA.

The visitation of locusts in Minnesota has proved a serious calamity. The total damage, thus far done, consists in a loss of about one twelfth the usual crop, or about the same as if the average yield throughout the State were diminished one and a half bushels below the average per acre. The plague extends over one tenth of the cultivated area of the State, and involves about one thirteenth of the population.

The insects, we notice, are universally styled "grasshoppers," which is incorrect, although the mistake, owing to the confusion of names, is a natural one. The principal points of difference between the locust and the grasshopper consist in that the latter is usually of a green color and is more active by night than by day. Grasshoppers, moreover, do not associate together nor migrate in large numbers, while their flight is short and unsteady as compared to that of the locusts, beside being noiseless. The locusts which have appeared in Minnesota are, when full grown, of about an inch and a quarter in length, and of a dusky grayish color, the heads being reddish and the under wings, when spread, of a coppery hue. The eggs are gray, ovate, and about as large as a wheat corn, and are deposited in clusters in the ground and under the grass and stubble. When hatched, the insects feed on the nearest vegetation, and then rise in vast clouds, seeking other pastures. A Minnesota settler, who has suf-

fered severely from their ravages, in writing to the *Minneapolis Tribune* describes a throng of the locusts as resembling a huge snow cloud, often completely obliterating the sun. The lower insects fly at a height of about forty feet from the ground, and the others fill the air above as far as the eye can reach. When they settle on a field of grain, every stalk is covered, so that the entire field seems to have suddenly turned brown. They do not eat the grain but bite into the tender stock and juicy kernel, and suck out the vital sap, leaving every particle of vegetation dead, so that within a day or two the entire crop becomes dry and withered. Their appetite seems especially directed toward garden stuff and grain, but frequently the voracity is such that every living green thing is devoured before they rise.

Minnesota farmers assert that there is no remedy. Fall fires do no good and water and frost are without effect. Plowing up the ground where the eggs are deposited or burning over the grass where they are laid during the spring, it is believed, are the best known preventives. The worst enemy of the locust, however, seems to be a little red parasite, which gets under its wings and gnaws into the very vitals of the insect. Dead locusts are found covered with these worms. Various portions of Europe and the north coast of Africa have suffered greatly from the plague both recently and in the past. In France, during May and June, when the insects first appear in the fields, all the women and children turn out to hunt them. Four persons grasp the corners of a sheet, two in advance holding their ends close to the ground and the couple in rear elevating their corners, so that the sheet is held at an angle of 45°. In this position, the cloth is carried over a field several times, the insects being forced to rise, when they fall upon the sheet and thence are tumbled into bags. Some idea of the immense numbers of the locusts which may thus be destroyed may be gained from the fact that a single peasant, with an entomologist's small net, has been known to capture 100 pounds of insects in a day, equal to about 80,000 eggs destroyed.

The Arabs drive off locusts by making great bonfires, producing large quantities of smoke. In Algiers, the most effective plan is said to be spreading large nets over the insects early in the morning after they have become gorged and inert through feeding, and then collecting them in bags and bury them in lime. Leaving the dead bodies on the ground is apt to breed infection. Harrowing over the fields, where the females lay the eggs, seems, however, to be a widely followed plan of destruction, as, if the eggs be scattered, the sun soon dries them up. Birds and toads are excellent auxiliaries in disposing of the eggs after a field has thus been gone over.

FOUR HUNDRED AND FORTY-FOUR MILES, AT OVER FORTY MILES PER HOUR, AND THREE STOPS.

An evident improvement in the direction and appointments of the principal American railways is in progress, an example of which is seen in that portion of the Pennsylvania Railway between New York and Pittsburgh. The road is provided with 60 lbs. steel rails, oak ties, broken stone ballast, and the best splice joints. The bridge work is of the most substantial character, the superstructure is smooth and solid, the cars and locomotives superior in construction, all the latest appliances for safety being likewise supplied, such as Westinghouse air brakes, safety platforms, switches, block telegraph signals, etc.

The run of 444 miles from Pittsburgh to New York is made in eleven hours, with only three stops, being an average rate of over 40 miles an hour, as follows: Pittsburgh to Altoona, 117 miles, stop 5 minutes; to Harrisburg, 132 miles, stop 20 minutes; to Philadelphia, 105 miles, stop 5 minutes; thence to New York, 90 miles. The locomotives dip up water from side troughs at certain stations without stoppage. The trains are comprised of magnificent Pullman parlor cars. It would be difficult to name any stretch of railway in the world, of equal length, where passengers can be more expeditiously and luxuriously carried.

The railroad mileage of the United States now exceeds the combined mileage of all Europe, although the population of Europe, 282,000,000, is seven times greater than that of this country. Every year adds to the improvement as well as the length of American roads. How to make our railways better and safer is the constant study of the legion of engineers, inventors, and managers who are connected with them. The practical results of their labors will be naturally manifested in gradual changes for the better in all branches of railway service.

The Annual College Regatta.

The annual regatta of the principal colleges took place this year on Saratoga Lake, N. Y., July 18. The winning boat was that of Columbia College, New York, which came in two boat lengths ahead. Time 16m. 42 sec. Distance three miles. Wesleyan was second, and Harvard third. The colleges which contended were Trinity, Princeton, Cornell, Yale, Harvard, Wesleyan, Columbia, Dartmouth, and Williams. The attendance of spectators was very large, and much enthusiasm prevailed.

PHOSPHORUS BRONZE.—Some of the brands will bear a considerably greater breaking strain than steel itself. It appears, also, to be suitable for sheathing ships, since, when immersed in sea water, it loses scarcely more than one third as much as is lost by the best sheet copper.

MINERAL OIL may be detected by its property of imparting a fluorescence to animal or vegetable oils, and by its aromatic odor on burning. The presence of resin may be ascertained by its giving a deeper color with nitric acid than that given by the pure oil.