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Scientific American.

THE INSPECTION OF STEAM BOILERS.

There is no doubt that a steam boiler is in many respects and care, while neglect or ignorance may have the most companies has been the necessary result. fatal results. In regard to a powder magazine, all it needs to be perfectly safe is to be left alone. Neither neglect in the watch nor absence of attendants can involve any danger; in against by very simple precautions and well constructed lightning rods. Age will not deteriorate a powder magazine; on the contrary it will prove the reliability of its construction and management and the safety of its location; but, on the contrary, age is, in a steam boiler, an element of the most imminent danger, and, as experience shows almost count of this remarkable physiological experiment. daily, it is the main cause of the disasters which of late have become alarmingly frequent.

engineers.

that the boiler had actually been tested at the pressure re. often been neglectful in their duties, and, trusting to good luck, gave the certificates without making the test to the full extent as required by law. This is a second cause that effective as intended and expected.

A third cause is the incapacity of many of the inspectors, who used to be appointed after an examination so ridiculously easy that any schoolboy who has learned his lessons so that when the old, ignorant inspectors are weeded out, the purchase of new ones.

The thorough investigation to which the Sewanhaka dis aster referred to above has given rise shows that a small weak spot in a tube in the rear of the furnace, by suddenly giving out, threw a jet of steam forward, which, like a back so long a period, of which there are instances on record, or draught, threw the fire out of the furnace doors and ash they did not believe the truth of such records. They judged pit, and set the dry woodwork around at once in a blaze. only from the results of many well known constrained This escape of steam was so small as not to interfere per- fasts which ended fatally within thirty, twenty, and even ceptibly with the boiler pressure, as the engine could be ten days, and were kept under unfavorable conditions, often kept running until the boat was run ashore, which was done ' by delicate girls of comparatively tender age and of a feeble so successfully that all lives might have been saved if the constitution, perhaps of consumptive tendency to begin with; passengers had not lost their presence of mind in the panic therefore they declared all claims of those who pretended to which ensued after the discovery of the fire.

The disaster in question promises to be especially useful in long a period, and hence the clamor of defective surveillance.

lessness or recklessness of those in charge. Many boiler owners, therefore, have grown disgusted with the United a much more dangerous neighbor than a powder magazine. States inspection, calling it a farce and an imposition, and In order to be safe a steam boiler needs continual attention the flourishing condition of the inspection and insurance

.... DR. TANNER'S GREAT FAST.

We call the attention of our readers to the full account of fact, when the doors are securely fastened, no attendance Dr. Tanner's world celebrated great forty days' fast to be whatever is needed. The only dangers are downright impru- found in the SCIENTIFIC AMERICAN SUPPLEMENT of this dence with fire, and lightning; both are easily guarded week, No. 244. It is from the pen of Dr. Vander Weyde, who, in his position as one of the watchers, and in his capacity as Professor of Chemistry of the U.S. Medical College, when the fast took place, had charge of the chemical and microscopic investigations, and therefore ample opportunity to collect the data required to give the complete ac-

It should not be lost sight of that this case is very different from cases where a fast is held by necessity, such as being It is a peculiarity of human nature that familiarity with compelled by disease, by shipwreck, by being lost in a wil danger begets contempt of the same; hence that owners and derness or forest, being buried in a mine, or lost in a cave. managers of steam boilers have proved themselves so neg- Dr. Tanner had enormous advantages over all these cases, lectful that all civilized governments have enacted laws to and hence that he could indulge at once in hearty meals, as secure more safety against steam boiler calamities (we will his digestive apparatus was not impaired by disease, nor his not say accidents, as everything has a cause) than are nervous system shattered by anxiety; in such cases it would afforded by the care of the owners themselves and their be very dangerous, if not fatal, at once to indulge immediately in such abundance of food. In the case of shipwreck, the We have such laws, but unfortunately they are not suffil exposure of the survivors, resulting in a total want of any ciently effective, and this for several causes: first, they are comfort, but to the enduring a suffering from other distressing not framed according to the full light which science and ex- discomforts, and exposure to the elements, contributes as perience has shed upon the subject; they only require a test much if not more to the fatal results than the need of nourof hydraulic pressure of the boiler, a test which will not ishment. To this must be added the anxiety and uncertainty reveal weak spots which may be the result of faultive de- which keeps the nervous system upon an exhausting strain. sign, imperfect construction, or wear by age-weak spots It is the same with those being lost in a wilderness or forest, which, being worn down so far that they could just stand Of these the forest gives the best chances of survival; but in the pressure of the test, soon after, by continued wear, give case of burial in a mine, the utter want of light and the out at a lower pressure. The Sewanhaka disaster appears gloom surrounding the victim, combined with the extreme to be due to a cause of this kind : namely, in the supposition anxiety, make a fast under such circumstances the most destructive to the nervous system. Persons who, for instance, quired; but there are doubts in this regard, as it is well were lost in caves, such as frequently happened in the Mamknown that inspectors appointed by the government have moth Cave, were, after only a few days' search, found to be nearly insane, so much so that they hid themselves from the searchers

It is evident that Dr. Tanner had an easy time, if his fast the laws passed by the United States Government for the is compared with that of any of the fasters for causes menpublic safety in regard to steam boilers have not been as tioned above. If he had been locked up under the threat that no food would be given him for forty days, he surely would not have stood it so well, as the mere consciousness of the constrained situation would have affected his mind, and all ease and comfort would have been at an end. To in natural philosophy can pass it. We are glad to say that the contrary, his mind was kept at peace because he had recently great improvements have taken place in this regard, plenty of air and water, the comforts of good shelter, and all the conveniences of civilized life; he could read his and more capable ones are appointed in their stead, public papers and keep up his usual correspondence, walk, ride, or safety will become greater in this regard, provided, how- stay at home, converse with congenial friends, and, best of ever, that also the inspectors are men of integrity, who will all, he knew that if he wanted food it would cost him not hesitate to condemn boilers even when the owner offers only a word to obtain what he desired at once. Fasting a bribe to save himself from the great expense involved by under such circumstances can, of course, be much longer prolonged than if it is done by necessity.

These facts were overlooked by those who from the first declared a forty days' fast an impossibility, and staked money on it. They were not well informed about actual fasts for be able to fast as long as forty or even only thirty days There is one consolation after such calamities, not for the as fraudulent and impossible without the deception of sepoor victims and their relatives, but for the survivors and the cretly taking food. Having this as a fixed idea in their minds, public in general. It is that every such incident teaches a they expected that a careful watch would surely cause the lesson which makes the future more safe in this regard. death of any man who pretended to be able to fast for so

this respect. It will result in a revision of the laws on It must be a satisfaction to Dr. Tanner that his uprightsteam boiler inspection, on the choice of the men to be ap- ness and honesty in regard to keeping strictly to the condipointed as inspectors, and on their behavior after being ap- tions of his self-imposed trial are now generally granted even pointed, convincing them that they are not irresponsible for by his former most violent opponents, who acknowledge the consequences of their carelessness in giving certificates freely that his behavior as a gentleman has proved him to be for old and worn out boilers, as was the case with the Se- far above surreptitiously taking food while he was pretending to fast. They have had their eyes opened to the fact that Dr. Tanner's case was very different from most other real or tough, and wiry constitution, at an age between forty and

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wanhaka. They have, as well as the owners of the boat, been arrested for manslaughter.

In regard to the revision of the law, the best which can be done is to adopt the mode of inspection practiced by the pretended fastings; that in him we have a man of a strong, steam boiler inspection and insurance companies in London, England, and in Hartford, Connecticut. These companies, fifty, which, for such a constitution, is that of the greatest who make themselves responsible for damages to boilers resistance, a man provided with a copious layer of adipose under their charge, are not satisfied with the mode of in- tissue or fat around his body, and of a weight of one hunspection prescribed by the United States law, but add to this dred and fifty seven and a half pounds, which is far above a thorough test of all parts of the boiler by means of the the average for his height, which is rather below the mehammer handled by a practical expert, who in this way can dium, so that he must be classed among the small men. A tall detect any weak and dangerous spot. If such a spot is found man of that weight surely would not stand it as well. Even the owner has to have it properly repaired, or the company a tall man of greater weight would possess no advantages, own inspectors.

explosion of boilers in charge of the insurance companies the first to break down under each circumstances.

has very rarely caused any disasters, and if one gave out, Dr. Tanner may not have proved that everybody can fast

will not insure it, which is only done after approval by their as army statistics prove that large men, who may be stronger in regard to muscular power, are less strong in regard to Statistics are there to prove the results. While boilers ap-their powers of endurance than smaller men, who, as is proved by the United States inspectors have been continu- well proved by long experience, stand various sorts of pri ally exploding, sending death and destruction around, the vation and fatigue better than large men, who usually are