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FIRES IN COTTON CARGOES.

According to the records of the British Board of Trade, there have been 171 fires on cotton-laden ships crossing the Atlantic from this country during the last ten years. The cause most frequently assigned for these fires is spontaneous combustion, but the various investigations which have been made have failed to furnish sufficient evidence to establish this as the true cause. A very serious fire occurred on the Inman line steamer City of Richmond in June last when she was on a voyage from New York to Liverpool.

Steam was turned on the burning cotton, and this kept it under control until the vessel reached Liverpool, and had commenced unloading, when the fire broke out again with great fury, insomuch that the space occupied by the cotton had to be filled with water. The inspector for the Board of Trade in his official report stated that if steam could not have been applied to the fire, and had the deck over the space occupied by the cotton not been of iron, the City of Richmond would not have reached a port of safety.

This fire, taken in connection with the many which have preceded it, recently caused a spirited debate in the English Parliament. The debate was started by an inquiry as to whether the government intended taking any steps to prohibit the carrying of cotton on passenger ships. In replying to this question, Mr. Balfour said that, in regard to spontaneous combustion being a cause of fires in cotton cargoes, he thought that as the result of inquiries made not only by the Board of Trade, but by the underwriters, by Lloyds and by the shipping community themselves in England and in other countries, this idea was, if not discredited, at any rate much less generally held now than was the case a few years ago. Of the 171 cargoes in which fires had occurred during the last ten years, 81 occurred in the port of loading, 45 in the port of discharge, and 45 during the voyage. If spontaneous combustion were generally the cause, it was obvious that it would occur after the cotton had been allowed a little time to heat, and not so much in the early days after loading. Mr. Balfour said further that he had examined the tonnage of the cotton which was loaded at the different ports in America and compared it with the number of fires which had occurred in ships coming from each of the ports and he found that the number of fires was not very disproportionate to the number of tons at each port, and he thought that the fires did not occur, so far as America was concerned, from causes which were prevalent in one port more than another. The origin of the fires was wrapped in obscurity. There might be cases of spontaneous combustion, and some fires had occurred through electricity being generated between the iron bands and the cotton.

It is stated that, while there have been one hundred and seventy-one fires in cotton cargoes from this country to Europe during the last ten years, only four fires have taken place in cotton brought from India up to 1887, and since that date there has not been a single occurrence of that kind. The quantity of cotton shipped from this country, however, is very greatly in excess of that received in Europe from the East.

Edward Atkinson, the well known writer on economic subjects, has recently called attention to the alarming increase in the number of fires on ships loaded with American cotton. He says: "American cotton is treated more barbarously, more unsuitably, more wastefully and more dangerously than any other great staple of any kind or than any other kind of cotton in the world. From the time it passes the gin until the time it reaches the factory, the bale is abused. It is badly made; it is badly covered; it is badly cut; it is badly broken; it is rolled in the mud; it is exposed to the weather, and is always in a condition in which it may become most liable to the impregnation of cottonseed oil, and thereby become liable to spontaneous combustion." Mr. Atkinson says further that if cottonseed oil is extracted where the cotton is ginned, oily locks may get into the bale. Where such impregnated fibers of cotton are in the center of the bale no danger may ensue, but the contrary is true when it is on the end or side, and these portions become broken, so that air may enter the interstices among the fibers, making the right combination of fiber, oil and oxygen, causing rapid oxidation, which is known as spontaneous combustion. "Fires have occurred in risks under my supervision which could be directly traced to this cause," says Mr. Atkinson. "Locks of cotton saturated with cottonseed oil have been sent to me from factories which, when put into our special apparatus for oxidation or for aeration, have been set on fire spontaneously."

In support of the statement that the persons who pack the cotton are guilty of great carelessness, it is shown that at cotton mills where each bale is carefully examined before it is used there have been found oily cotton, cartridges, broken pistols, matches, beer bottles, pieces of grindstones, old hammers and the like. A great deal of American cotton is packed in very coarse gunny cloth, the fibers of which are so far apart that the staple is left exposed. Tightly packed

and well covered cotton is much less likely to catch fire than that which is put together in a haphazard way, and the British Board of Trade reports that it was one of the difficulties encountered in their inquiries that if a spark fell upon cotton, it was often proved that the fire ran along the edges of the bales until it came upon some half packed bale, where it settled.

While persons interested in shipping claim that cotton is just as safe a cargo as anything else, it is seen that special precautions are taken to guard against fire. One of the officials of the Norddeutschen Lloyd line recently stated that when cotton is carried in one of the steamships of that company it is placed in a special apartment, where a fire can be flooded out speedily. A representative of the White Star line stated that great care was taken with cotton. No smoking was allowed while the men were stowing it, and it was placed away from the boilers. When it has to remain for any time on the wharf it is carefully covered and watched.

Some months ago a fire occurred on the Britannic while the vessel was at sea. The ship was stopped and a few bales were thrown overboard. The fire was believed to have been in the cotton, but it was not known exactly what started it. Within a month or so of this occurrence there was a small fire on the Britannic as she lay at her pier. It was supposed that oil had gotten into some cotton; since which time orders have been given not to accept oil, resin, and other inflammable goods as freight, no matter whether there is any cotton in the cargo or not.

The underwriters, who annually pay out in losses for fires in cotton cargoes many times the amount of premiums received from such risks, have naturally given considerable attention to tracing the causes of such fires. An officer of one of the largest companies in New York stated recently to the writer that the numerous fires which have occurred in cotton cargoes are, in large measure, due to lack of care in packing the staple in bales and stowing it in the holds of vessels.

The English Parliament has gone so far as to consider the question of prohibiting steamships which take passengers from carrying cotton. If such a law were enacted, a profitable line of business would be made unavailable for these vessels, whereas if the cause of the numerous fires is really due to careless handling of the cotton in this country, of which there seems to be very little doubt, the remedy should be promptly applied here, so that this menace of fires in cotton cargoes may be removed.

THE CONTAGION AND RAPID SPREAD OF LEPROSY.

In continuation of the article in the last SCIENTIFIC AMERICAN (Sept. 19), I desire to point out the most likely cause of the introduction of the taint into non-leprosy blood, and to call attention to a danger which I believe is now becoming imminent. Agnes Lambert, whose recent epitomization of the literature of this subject has attracted much attention in England, has these pertinent words to say: "Is it not, then, a wonderful thing, not that a cure has not yet been discovered for leprosy, but that with men of science it is still an open question whether leprosy is communicable or incommunicable, contagious or hereditary; whether it is due to insufficient and bad food, or bad climate and dirt, or all combined; to a lack of meat or the absence of vegetable diet; to the use of salt fish or the want of salt? Such, however, is the case!" As Drs. Sir Morell Mackenzie, Vandyke Carter, Sir Erasmus Wilson, Munroe, Wynne, and Rev. Ignatius Grant have pointed out or tacitly admitted in their writings, this uncertainty and the rapid spread of the contagion in the last quarter of a century is very directly attributable to the unfortunate haste which led the Royal College of Physicians of London to issue their misleading and now famous report in 1867. The many data of a negative character, which came in to the college through the medium of the world-wide consular and colonial service of the English government, were allowed to outweigh the comparatively few of a positive nature, though the latter were of a most unmistakable kind. So they reported that it was not to be regarded as a contagious disease and that there was no pathological warrant for leprosy, segregation or any laws affecting the freedom of the leper. To again quote Mackenzie: "The leper houses throughout her Majesty's domain were thrown open. Each discharged its measure of pollution into the stream of healthy life near it. * * If leprosy slew its thousands before, it has slain its tens of thousands within the confines of the British empire since 1867."

Where Great Britain led, there nearly all of the Americas, save where French or German influence were more potent, followed; and the consequence has been the fearful strides which this disease has made. Since then the terrible fate of Damien and many of his followers; of Keanu, the Hawaiian convict, who was given the choice between inoculation with the leprosy virus and death, and who, choosing the former in 1885, was in 1888 far advanced in the tortures of the disease; and scores of less famous cases, completely dis-