

The Collieries of the North Pacific.

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tions of the decline in prices of his staple industry. Instinctively he appreciates the logic of the argument and the force of the illustration, and were it not for the counteraction of certain extremists, he would, as a rule, be prepared to join issue and work more harmoniously with the operator of the mine. Another unique though unavoidable feature of these colonial pits presents a striking analogy to a certain period of the decline of the Roman Empire, when slaves were introduced into the Roman mines and taught the art of war so successfully that they were ultimately able to subvert the very empire, the prosperity of which they priorly defended. This is practically the case with us. In our mines we educate to splendid perfection a race of engineers, who at will sally forth into the uttermost parts of the earth and initiate the industris which necessarily supplant our own. This, however, is merely the evolution of industris, and reflects the greatest possible lustre upon the enterprises of this country, which stands far from every other country under the sun in which coal can be mined.—Correspondence of the *British Colliery Guardian*.

Irrigation.

Irrigation is a subject of living and growing interest in the United States, particularly in the west, where the proportion of arid lands is greater than in other sections. The interest in the subject has grown as the margin of naturally fertile land has gradually become narrower, and irrigation has now taken on a degree of importance to the agriculturalists in large districts of the country such as it did not have in earlier times. The *Independent*, of New York, has deemed the topic one of so much concern to the public at large that it has published in a recent issue a series of eleven special articles dealing with different phases of the general question. The history of irrigation is discussed in the opening article by Major J. W. Powell of the United States Geological Survey; Mr. Herbert M. Wilson of the same service treats of irrigation engineering; Mr. F. H. Newell of the Census office deals with statistics of irrigation and water supply; Mr. Frederic V. Coville of the Department of Agriculture describes the relation of plant life to irrigation; Mr. Arthur P. Davis of the Geological Survey considers the storage of water for irrigation; Mr. James K. Reeve touches on the practical operation of irrigation, and other articles in the series are devoted to a description of irrigation in California, Montana, Wyoming, and the Texas-New Mexico region.

As will be seen, some of the articles deal with more or less special and technical aspects of the general subject and appeal to special and local rather than to general interest. Others are of a more general character, and of this kind is the opening article by Major Powell, which aims to give a brief history of the industry of irrigation, together with a short statement of the condition of the industry in this country. In this article the writer directs attention to what he terms the greatest paradox of history, namely, that everywhere throughout the habitable globe the first agriculture begun in arid lands and the first comparatively dense population was found everywhere in regions where the heavens refused sufficient moisture for the crops to grow. In Europe, Asia, Africa and America alike this fundamental art began everywhere under conditions of great aridity on sandy plains and hot deserts. This fact is explained on the theory that the fertile lands were naturally first occupied by men in a savage state, and, speaking generally, by a scant population. There remained only the arid lands which could not be settled by savage men. Some degree of providence and self-denial was required

by settlers on these lands, but in one direction they furnished a line of least resistance, for it was found impossible to conquer nature in her strength with the rude tools of early times, and it was discovered to be easier to control water than forest growth, so that the first efforts made to conquer the soil resulted in transforming deserts.

The history of irrigation from the earliest times is briefly traced by the writer, who concludes this portion of the paper with a brief account of irrigation in the United States, in the course of which he says that while the most highly developed agriculture of the world is now found in some portions of California, the industry of irrigation is still new to the people of the United States, and they have yet to learn important lessons which the inhabitants of oriental lands have learned by centuries of experience. Some of these lessons the writer says are as follows:—

First: The waters of perennial streams that are gathered on mountains, hills and plains distant from the fields irrigated thereby, have to be divided among the irrigators. While the waters are abundant and the lands redeemed are but small areas, the distribution of water rights to farmers is apt to be neglected; but the time is at hand when in many regions of the United States water rights will be relegated to irrigators by some just method to secure equity and prevent litigation, and even to prevent social convulsions, which are already breaking out here and there.

Second: The people must learn that the supply of water is insufficient to irrigate all the land, and that only a small per cent. of the total area of arable land can be converted into irrigable land.

Third: The people must learn that the seasons of drouth fix the limit of agricultural development; that seasons of great rainfall and plenty of water lead to excessive development of irrigation, so that when seasons of drouth come, disaster and great suffering result.

Fourth: The people must learn to construct irrigating works in such a manner that they will resist the forces of extraordinary seasons of flood. In every region a great flood comes sometimes. The maximum supply of water may be reached one year in a decade; when it comes, if the hydraulic works are destroyed, prosperity is transmuted into adversity.

Fifth: The people must learn the importance of gauging the streams from day to day and year to year for a series of years sufficient to discover the maximum and minimum flow, in order that they may construct their works intelligently, and have definite knowledge of the amount of land that can be irrigated. The maximum must control the strength of the works, the minimum must control the area which can be permanently redeemed by irrigation, and the average flow will give the amount of land which can be cultivated from time to time in excess of the area of permanent cultivation.

As bearing on the importance of the subject of irrigation it is interesting to note, on the authority of Mr. Powell, that about two-fifths of the area of the United States, exclusive of Alaska, is so arid that artificial irrigation is necessary. Although, it appears, the smaller streams are utilized during the season of growing crops, which averages from two to three months each year, but for the remaining portion of the year the waters run to waste. "Future development," Major Powell says, "depends upon three sources of supply yet little used and upon the more economic use of water already controlled. First, the great rivers are to be brought out upon the lands; second, the waters now wasted during the season when irrigation is not practiced are to be stored in reservoirs. This industry has already fairly begun. Third, the artesian and pump waters yet undeveloped are to be brought on to the lands. To utilize the great rivers and to store the surplus waters topographic and hydraulic surveys are necessary; and to utilize artesian and pump waters geologic surveys are necessary."

Fires and Insurance.

Sombody has said that carelessness is at the bottom of every accident. It might with equal truth be applied to fires other than those caused by incendiarism. Through lack of proper oversight on the part of the manufacturer a stove, furnace or fire is allowed to go out with a defect in it, and some day the building is discovered to be on fire. The bricklayer improperly builds a chimney, and one day the roof or garrat is found to be in a blaze. Inflammable material is left too near the fire place and this results in the brigade being called out on another occasion. Other causes of fire through carelessness are seen in the handling of oil and in the allowing of oil, rags, waste and dirt to accumulate in heaps about the premises until upon taneous combustion ignites them. Last month the total loss by fire in Canada and the United States was the largest ever recorded. This together with the fact that last year was a trying one for the fire insurance companies, is leading underwriters to seriously consider the advisability of advancing rates. In some places they have already decided to do so, notably Montreal for instance. There the increase to retailers is something like 40 per cent. But to what extent may the fires there be traceable in the first instance to carelessness, it is felt by the insurance men that the losses have been at good deal heavier than they would have been had there been an efficient fire brigade. Higher rates of insurance means an addition to the cost of doing business. This, in these days of keen competition and small profits, is anything but desirable. If business men in Montreal or in any other city, town, or village want low rates of insurance they not only need an efficient fire brigade but they need to exercise greater care in guarding against outbreaks on their own premises. The greater the vigilance exercised the fewer fires will there be. It must be remembered that there is an actual science in fire insurance as well as in life insurance, and as the ratio of fires falls, the rates must in time follow. Oliver Wendell Holmes says that once upon a time it was arranged that every man and woman in the world should, at a given time, send up a simultaneous shout. Had the intention carried the noise would undoubtedly have been great. But if all the business men in the country were to simultaneously adopt measures for guarding more thoroughly against fire there would be a surprising falling off in the number of fires and in the losses resulting therefrom.

A notable feature about the fires that have occurred of late has been the number of sufferers that carried no insurance whatever. Storekeepers there always have been, and storekeepers there always will be, who will seemingly trust all to Providence and nothing to the fire insurance companies. But fire seems to have visited a good many more of them during the past month or so than formerly. The proportion, however, may not have been any greater, the larger showing being possibly the result of the increased number of fires. In some instances where a conflagration had visited a place, among those burned out were two, three and four merchants who carried no insurance on their stocks. Others, and some of them fairly well established firms, had carried insufficient insurance and were compelled to assign. Every merchant should not only insure his stock, but do so to a large per cent of its value. Unless he has capital enough to liquidate every indebtedness, should his stock be destroyed, it is little short of criminal for a business man to neglect to properly insure.—*Grocer*.

A report from the east says: "Eddy has dropped the price of his matches 20c a case and will pay freight on five case lots. The cut is due to the close competition. The price now is \$3.70 for single cases and \$3.60 in five case lots."