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**THE SCIENTIFIC AMERICAN SUPPLEMENT**

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## NATURAL GAS WELLS IN OHIO.

Drilling for gas was begun at the town of Madison, Ohio, by Messrs. Gunning and Sond on the 29th of June, and by the 14th of July the well had reached a depth of 780 feet. At this point a heavy vein of gas was struck. The well was continued down to 1,025 feet, about 200 feet of the distance requiring tubing on account of the influx of salt water. The pressure gauge at the mouth of the well registered 100 pounds. The parties named are now supplied with fuel and light.

The great value of natural gas has already been demonstrated at Pittsburg and neighboring places. So rapidly and completely has the substitution of gas for coal taken place, that the principal mills of Pittsburg are now using the new fuel. Oil in the days of the great excitement did not attract such broad attention as has the natural gas in the last year or so, and the wonder now is why we have never used it before. The area of its distribution is probably as large and almost coincident with that of petroleum. We know with a degree of certainty prompted by its commercial importance that our supply of petroleum comes from the rocks of the Devonian, which immediately underlie the productive coal measures, and it will be a matter of much interest to follow the development of natural gas, and note the order of production which the different States and Territories will assume. Of the petroleum producing States, Pennsylvania of course ranks first, then comes New York, and then California. These are followed by West Virginia, Ohio, and Kentucky. In the Rocky Mountain country, Wyoming, Colorado, and New Mexico have been found to yield some small quantities of the oil, but those regions have as yet been only imperfectly exploited. Of the wells opened over this large territory, many were *blowing* wells, and carried with them a large amount of gas, but there was no constancy in this respect, and no particular area could be pointed out as productive of gas above the rest. The whole subject is too new for any complete knowledge of the distribution of the natural gas, but so far as the point has been determined, our assumption of its general coincidence with the oil country seems to be justified. Whether, however, the same quantitative order that we have named for petroleum will follow in the case of the new fuel is still a question. As every one knows, it is already largely used in Pennsylvania and to some extent in Ohio, West Virginia, and other places.

Unless we regard the earth as a vast reservoir stored with gas, somewhat after the order of the Pintsch system of compression, we must contemplate a time when this fuel supply will become exhausted, and abandoned pipe lines will tell the same story as the decaying oil derricks. But the past of our industrial progress is a promise for the future; and we may feel with confidence that as the candle gave way to whale oil, whale oil to petroleum, petroleum to gas, and gas to electricity, so, with our fuel, that natural gas will disappear, only to make room for something still better.

## SHALL OUR CANALS BE MAINTAINED?

The question of the maintenance of American canals is just now exciting a very lively interest, and not a little argument is being expended upon the advisability of their improvement and extension. The scheme for making the Erie a ship canal is particularly under discussion. A number of prominent people in New York city and throughout the State have taken preliminary steps to form an organization to promote the improvement of the New York canals. These gentlemen have called a conference, to be held in the city of Utica on August 19. The chief exponent of their views so far brought forward is the Hon. Horatio Seymour, who, in a letter of some length, has formally stated the reasons which should induce the maintenance of the canals. The document in question contains many facts of statistical interest, but to us they indicate different conclusions from those drawn by the honorable gentleman. Any remarkable development, such as that which has taken place all over the United States during the several past decades, presents a very tempting field for analysis; one wants to discover the specific causes for such prosperity, and, having reached them, to give them a wider prevalence. The motive is certainly most commendable, but its proper development requires a nice judgment.

It is a large statement to make, as does the gentleman named, that the prosperity of New York State, as well as the Union at large, is almost entirely the result of the Erie Canal. No one denies that the Erie Canal has been an important factor in our development, and on some grounds its maintenance, as well as that of the other main arteries of our water routes, may be desirable, but the cause is not helped by draping it with too much beneficence. It was admittedly good, but it was not supreme.

Such remarkable progress as it has been our good fortune to enjoy is the resultant of such a host of elements that it is quite impossible to lay hold of one, even though it be among the chief, and with any propriety ascribe to it the merit of the whole. Nor, indeed, would the fact of its predominance in bringing about so desirable a result be a strong argument for its continuance, since the achievements of one generation are the stepping-stones and not the models for the next. The question would seem more aptly to turn on what the canal system is accomplishing for us now, and what it can do for us in the future.

The West is at present the theater of action from which we may draw many a just conclusion, and the fact that the canal is there seldom thought of, even in localities where a network of irrigating ditches is an essential feature, and could with comparative ease be made the basis for an extended series of water routes, is certainly not an indication of the interchangeability of railroad and canal. There are unmistakable signs abroad that the canal is something savoring more of the past than the future. Bands of steel seem a more fitting accompaniment of telegraph and telephone than do those sluggish, malarial water courses. It seldom happens that when two systems are in operation side by side, the one best adapted to our needs languishes, drops behind in the race, and is finally almost out of sight, while its less deserving rival expands with a growth that is almost magical. Yet such, we are told by the canal advocates, is the case between these two rival systems of transportation, even though the comparison is further emphasized by the fact that the present laggard had decidedly the best start. But there are many found who cannot agree to the statement, for there is a growing belief in the survival of the fittest in things mechanical as well as physical.

There is one argument brought forward in favor of the system, however, which may be deserving of attention. In these days of railroad coalitions, through freight pools and various forms of transportation combinations, it might be a wholesome check to have railroad directors remember that if their freight rates became too outrageous, recourse could be had to the canal for those more bulky goods whose indestructibility would survive a two-miles-an-hour rate of travel. To somewhat stretch a metaphor, the canal could assume in trade circles the airy position of the sword of Damocles, ever ready to descend upon the head of a too grasping railroad official.

The question of transportation is in the present day such a large one, and economical competition so close, that it is easy to reach the facts in the matter, without having to turn even to those unequivocal signs of growth and decay. The comparative cost between canal and railroad has more than once been discussed by such impartial bodies as the American Society of Civil Engineers, and their conclusions have certainly not been in favor of the former system. At the last convention of the Society, Mr. E. L. Corthell discussed the question at some length, and his arguments were conclusively on the side of the more progressive method. The inconvenience of the want of speed on a canal is one which it seems impossible to overcome, without an increased expenditure of power out of all proportion to the result. Experiments made on the traction power necessary to move canal boats at various speeds show that while the power necessary to move one ton is only 2½ pounds when the speed is 2½ miles an hour, it becomes 7 to 11 pounds at 4 miles, and reaches the enormous expenditure of 20 to 30 pounds when the speed attains the modest rate of 5 miles an hour. From this it follows that an economical speed must be only about 2 to 2½ miles. On the Erie Canal it is even less. The freight steamers make 40 miles in 24 hours. Professor Barlow's calculation, that the power required by canal boats varies as the *cube of the velocity*, is not in excess of the truth. The cause of this great resistance is due to the confined channel of a canal, where the "carrier" wave, which advances before the vessel, offers a continually opposing current to its progress, and is at the same time very destructive to the banks.

There are of course many classes of merchandise which, in spite of the want of speed, would still be carried by the canals, could they do so at any advantage over the railroads; but when it is shown, as Mr. Corthell has demonstrated, that in addition to all their other merits, railroads are the cheaper carrier of the two, there seems absolutely nothing to be said in favor of the canal. In England, in Canada, and in the United States, the experience has been the same. It is manifest that the canal cannot hold out against the railroad. Capital once expended in building a canal is devoted to the purpose forever, and if therefore we admit that it is lost, and in consequence omit all interest on the investment from our table of expense, there are localities where the canal can compete with the railway; but even under these circumstances the competition is fast narrowing, and with interest added to other expenditures, the railways will still be the winners. In the face of these facts, the wisdom of maintaining the system is even open to some doubt. The plan for its extension is certainly to be discouraged.

General Annenkoff proposes a sea canal from the Caspian into Michael's Bay, to render transshipment from deep into light draught vessels unnecessary. Such a work will greatly facilitate transport over the Caspian.