

pipe, with an overflow ahead of it which carries away the difference between the amount of water delivered and the amount required. The supply valve is kept sufficiently open to allow the water to half fill the hopper. The pipe is laid on a downward grade, varying from one to four per cent., towards the cliff. At the cliff, which it overhangs, there is a vertical leg about 26 feet long, the effect of the latter is to give an hydraulic gradient to the entire line sufficient to cause a flow of about 600 or 700 gallons per minute, when the pipe runs full bore; the resultant velocity causes all slaty material to be easily carried through the pipe.

In order to keep foreign material, such as bolts and spikes, from getting into the pipe and plugging it up, it has been found necessary to fit the hopper with a special grating, which consists of a cast iron plate, about six inches thick, perforated with $2\frac{1}{2}$ -inch diamond-shaped holes, the holes being V-shaped or zigzag in vertical section; this construction allows any round or square material up to about $1\frac{1}{2}$ inches in diameter to pass through it, but will not allow any material having a length of over $2\frac{1}{2}$ inches to pass. Further precautions are taken to cope with clogging in the line by having special oblong openings cast in the pipe every few hundred feet apart. These openings have covers screwed on, which can be removed at will. Should the pipe become clogged, lengths of small pipe, such as are commonly kept in stock, are coupled together and inserted into the opening immediately below the clog, and forced against the obstruction, the water pressure being kept in the meantime on the remainder of the pipe. Once started, the rush of water quickly clears the pipe.

Since the amount of water used for flushing purposes is already required by the colliery for condensing, the colliery and wash plant divide the pumping charges equally, and the cost of disposing of the slate by this method is very low.

The figures of a typical analysis of the coke from the washed coal may prove interesting. Such an analysis would be as follows:—

Moist.	Vol. and Com. Mat.	Fix. Carb.	Ash.	Sulphur.
12.5	2.25	90.50	7.25	1.22

Thus it will be seen that this plant renders possible the manufacture of a coke which is eminently suitable for use in the iron blast furnace from a coal which unwashed would be unsuitable, and in addition utilizes for this purpose the less desirable, from the fuel point of view, portion of the coal, that is, the screenings.

The writer wishes to acknowledge his indebtedness to the management of the Nova Scotia Steel and Coal Company for permission to use the information given and for access to the records of their chemist. The author is, however, responsible for the preparation of the average analyses and for the conclusions drawn.

INAUGURAL ADDRESS.

By the President of the C. M. and M. Society of South Africa.

(Continued from last issue.)

Apprenticeship to Mining.—For those who would take up the work of actual underground mining as a means of livelihood, the system of apprenticeship, as started by the Association of Mine Managers, would seem to be an excellent scheme, and it was with great regret that I learnt from some remarks made by Mr.

Laen Carter at one of our recent meetings, that "so far it had not been a success, and that at the present time there are very few apprentices underground." This is not as it should be. Means must be found to induce young men to submit themselves to a regular and thorough apprenticeship below ground, as is done by mechanics above ground, so that when a youth having duly served his term, applies for work as a full-fledged miner, the employer will have a guarantee that the applicant does possess a knowledge of the work he wishes to undertake, and to such as take a serious view of mining work and wish to learn thoroughly what is most necessarily, namely, the theory as well as the practice of the work, I would commend the evening classes in mining, which are held at the Transvaal University College, where the miner is taught how to work intelligently, and thus benefit himself, the mine, and also his fellow workmen. Under the new scheme of the Mine Managers' Association an inducement is held out to apprentices to attend these classes, which I find, on enquiry, have a large membership, and which are attended by men coming from far distant parts of the Rand, showing at the same time the attraction of the classes and the keenness of the students. The youth of this country has to learn to appreciate the fact that if it wishes to take a proper part in the development of the resources of this land it must take measures to submit to a course of study, not alone in one particular subject, but in a general knowledge of science, and to the youth I would say, the means are at hand, make use of them.

I look to the Metallurgical Trials' Committee, which has lately been formed under the aegis of the various mining houses, for much assistance to the mining and metallurgical world. Co-operation of this nature will permit of far fuller and more practical investigation of the merits of any invention or improvement than would otherwise be the case, and I am sure that all those who have thought out improvements, which they are individually unable to have tested or experimented upon, will note the constitution of this Committee with pleasure, and will not be afraid to lay their ideas before the representatives, as I am confident that all trials made will be carried out in the most thorough manner.

Agriculture and Agricultural Chemistry.—There is little question that, apart from the mining industry, which is, undoubtedly, at the present time the staple industry of the country, there are enormous possibilities in the direction of agriculture, and owing to the many varied natures and constituents of the soils to be dealt with, the problems of properly dressing and manuring the land will provide much work for the chemist, without whose aid I fear those who engage in the farming industry will be but floundering in the dark. Those who read that most interesting production, the Transvaal Agricultural Journal (which I may state is free to every citizen of the Transvaal for the asking), will appreciate the great amount of work which has been done in every branch of agriculture by those employed on the Government farms, and I trust that our Government will always realize the great value of the various researches which have been made in the past, and the value of which will perhaps be more apparent in the future, to those engaged in agricultural pursuits. We know that there is a prevalence of a great number of various description of pests, the occurrence of which dishearten the farmer and often indeed stultify his efforts, but I am sure that by perseverance and careful study the difficulties and dan-