(Mr. Scott ought to be commended for his courage. Has not he missed the point somewhere. If his bore hole discharged 1053·33 feet per minute what sort of vessel would be necessary for a ten hours flow. Has vena contracta anything to do with velocity? Will some one point out the errors in Mr. Scott's answer.—Ed. M. Record.)

THE 1905 EXAMINATIONS.

"PRACTICAL" writes.—I noticed in your last issue that you enquire into the possibility of some of the questions being worked which were set at the last examination for Candidates for Managersin this Province. You are certainly not the only person who has had reason to be in doubt on the matter and the successful candidate you mention is only one of many who were a little more than puzzled. I make no pretense at answering the questions set but I wish to start a discussion in the hope of getting the questions thoroughly thrashed out. Take the question on the safety valve. It is workable but the answer obtained from the data given is ridiculously small. Of course the question tests whether the student understands the method of working the thing out but to say the least the question is hard and given in vague terms. The following is the formula for working the question:

Let L = length of lever i. e. distance fulcrum to weight.

Let R = distance from valve to fulcrum, i. e. the short arm.

Let P = blow off pressure in lbs per sq. inch.
" D diameter of valve.
" W weight.
" B weight of lever.
" V weight of valve and connections.
" C distance of centre of gravity from fulcrum.

Then $d^2 \times .7854 \times P \times R = (W \times L) + (B \times C) + (V \times R)$

Now to get the values of the letters.

L eq. 30" + length of short arm. = 30 + R

R eq. is to be found.

P eq. 80 lbs,

D eq. 4 inches.

W eq. 7½ lbs.

B } these together eq. 12 lbs, so the student is left
V } to suit himself how he divides the weight between the two, and if he makes a mistake whose fault is it.

Make B eq. 8lbs.
V eq. 4 lbs.

C. eq. $\frac{30+R}{2}$ taking bar to be uniform.

This is rarely the case but as no information is given at to where the centre of gravity will be this is just as likely to be correct as guessing it.

$\therefore 4^2 \times 7854 \times 80 \times R = 7\frac{1}{2} \times (30+R) + 8 \times \left(\frac{30+R}{2}\right) + (4 \times R)$

$\therefore 1006\ R = 215 + 7\frac{1}{2}\ R + 120 + 4\ R + 4\ R$

$\therefore 1006\ R - 15\frac{1}{2}\ R = 335$

$\therefore 990\frac{1}{2}\ R = 335$

$R = .338\dot{3}$ inches,

This is a little better than ⅓ of an inch for the length of the short arm of the lever. Surely there is something wrong somewhere. It may be that I did'nt work the question right, but if not I would be glad to be shown the correct way, that is why I have worked the question out.

In the question on the bore-hole striking water from old workings the first portion (a) is easy enough. A pipe and pressure gauge fixed into the bore-hole would enable the pressure to be ascertained.

$$\text{The Pressure in lbs. per sq. inch} \over .434 = \text{head of water in ft.}$$

I hope some one will answer the second part of the question as I would like to know what reliable rule can be applied in such a case. Plans have in many cases proved unreliable and accidents have occurred through depending on them, so that method is out of the question. We cannot depend on the distance of the break or breaker from the actual holing because this will differ in different coals and will also differ according to whether the old workings are fallen in close to the edge of the barrier or are still standing. We cannot depend on the distance that water will find its way through the planes and pores of the coal because this also varies. If there is a reliable rule I should like to know it lest some day I should have to face a dilemma of this kind. We could be sure of eight yards and a little more as the thickness of the barrier, how are we to find out how much tuat little more is?

The question on the dam is'nt a question at all, it is simply a statement of certain facts relating to the dam. Nothing is asked for at all and any student who simply ignored the who'e thing would be justified in doing so, and would be entitled to any marks that were allowed. The thickness of the dam is not given and I suppose that is what it was intended to ask for but still the question part was omitted. This was probably due to a mistake and would hardly be intentional. This question is easily worked if it is the thickness that is required.

PRAISE FOR INTERCOLONIAL RAILWAY.

Canada's famous train, the "Maritime Express," the I. C. R. through train between Montreal, Quebec, Moncton, St. John and Sydney, is earning fresh words of commendation from distinguished persons. According to the St. John Globe, the address of Rev. Dr. Grierson, returned Missionary from Korea, was one of the features of the session of the Convention of the St. John Presbyterial.

Dr. Grierson spoke on the recent international students' convention at Nashville. The spdaker had to travel over six different railway lines to reach Nashville, but fouhd none so well appointed and comfo'table as the I. C. R In addition to this the Montreal Herald of May 30th. has the following expression of opinion of a well known professional man:

"Talking to a reporter recently a well known professional man who travels considerably remarked: "I always enioy the trip by the Maritime Express between Montreal and Halifax. There is more than a mere sense of comfortable travel, there is something that always makes me thoroughly contented, and never do I feel that irritability and impatience one is so apt to feel when taking a railway journey of long duration. The splendid cars and accommodation, the inviting meals and prompt service on the dining car contribute greatly to this feeling, I know, and the passing view of so many scenes of various beauty is soothinfi to the senses. But there is something more something I can hardly describe, but am inclined to attribute to the social atmosphere. You meet all classes and conditions of men while travelling but it seems to me that on the Maritime Express one always finds himself a fellow-passenger among people of a pleasant and interesting type. Some of my happiest hours have been spent on this journey."