

CORRESPONDENCE.

We invite students to submit to us any difficulties of general interest met with in the course of their studies. We will endeavour to answer their queries directly, and propose to publish in due course both questions and answers. Below we give our answers to some interesting and practical questions recently submitted to us.—[EDITOR.]

Dear Sir,

I have noticed that in the Stock Exchange Official List, certain American securities are quoted at so much per cent. I always understood that the Stock Exchange quotation related to a \$500 Bond, and if this is so, why is the percentage quotation given, and what does it mean?

I shall be much obliged if you will answer this question for me.

Thanking you in anticipation,

Yours faithfully,

STUDENT.

The SECRETARY,

Institute of Actuaries Students' Society.

American Dollar Bonds are almost invariably quoted in the Official List at a sterling price for Bonds for \$500, thus the quotation of 102—3 means that £102—3 is the price for Bonds of the nominal amount of \$500.

There are, however, certain Bonds which are quoted at so much per cent., thus 102—103 %. In these cases the holder has the option of receiving the amount of the principal and interest in London, America, or elsewhere, at a fixed rate of exchange, such rate of exchange and places of payment being settled when the original issue of the Bonds is made. This fixed rate of exchange as far as London is concerned, is shown in the Official List, bracketed with the name of the

security—*e.g.*, Rio de Janeiro Tramway, Light and Power Company, First Mortgage 30 year 5 per cent. Gold Bonds, 1935 (\$500 = £102. 14s. 10d.). A Bond of \$500 of this security is worth $500 \times \frac{102-3}{100}$ dollars, or £102. 14s. 10d. $\times \frac{102-3}{100}$ in sterling.—[EDITOR.]

London, 1st September, 1911.

To HON. SEC.,

Students' Society of the Institute of Actuaries.

Dear Sir,

I should be greatly obliged if by means of the Students' Society the following question could be answered:—"What is the best method to adopt to find the true yield, allowing for income tax, of a bond bought at a premium?"

Yours truly,

ENQUIRER.

The point for the Student to bear in mind in connection with this question is that income tax is deducted on the total interest payable; although from the purchaser's point of view a portion of each payment is a return of capital and should be employed in writing down the book value of the investment per unit. Consider a Debenture of 1, redeemable at the end of n years at par, bearing interest at the rate of g per unit payable half-yearly, and bought at a premium of K per unit to yield j (gross) convertible half-yearly, subject to income tax at the rate of t per unit.

The value of the security to yield a purchaser $j(1-t)$ net = $\frac{g}{2}(1-t)a_{\overline{2n}|} + v^{2n}$ where $a_{\overline{2n}|}$ and v^{2n} are calculated at rate $j(1-t)$.

$$\therefore 1 + K = \frac{g}{2}(1-t)a_{\overline{2n}|} + v^{2n}.$$

The net rate $j(1-t)$ can be found by the use of ordinary interest tables or Bond Investment Tables, and first difference interpolation.

Another method which is very simple and has been found to give exceptionally good results in practice is to enter Bond Investment Tables with $1 + K'$ where $K' = \frac{K}{1-t}$ and to multiply the interest rate so found by $1 + \frac{3}{5}tK'$ —the result is the gross yield j approximately.

PERSONAL.

Our congratulations are due to E. W. Townley, F.I.A., on securing a first class in the Part IV Examination of the Institute of Actuaries, and R. McN. Jones for a similar distinction in Part II.

We learn with pleasure that a Society of Actuarial Students has recently been formed in Liverpool.