

Westinghouse:

70

In the '80's young men had been taken in in haphazard fashion. One of the prides of the Westinghouse history - Lamme - who had written a letter to George Westinghouse which evidently pleased him for he ordered that he be given a position. It was nothing in harmony with his training. He ^{filled} followed brass in the electrical engineering room for a long time - did odd jobs. Accidentally it was discovered he could figure and finally the head of the department took him into his confidence, told him he thought for a long time he wanted a man who could calculate electrical machinery just as results were calculated in the mechanical design. He tried several boys. Nobody seemed to be able to do it. Would Lamme take it on?

There seemed to be a general awe of him because he had studied something that was called calculus which they greatly respected but did not understand. A little later Lamme made the calculation for the railway motor which after was adopted for the new Westinghouse system. It was, Lamme says, the first Westinghouse machine ^{that} actually produced some calculation.

His interest in ^{what} everybody was interested in and ~~what~~ everybody did is illustrated by Mr. Lamme's remark that

He gives a valuable rule when he said, "I made it a practice never to take home any of my regular routine work, but always to undertake, at night, something out of the usual that was particularly interesting to me. In this way, the evening work was somewhat of a relief from the daily routine." Very valuable to young people this showing them how to work to the best advantage.

Tells of himself, "This faculty for mental computation has been of more value to me than any other major trait. It has given me a quantitative or dimensional sense, or what might be called a sixth sense." (Page 71 and over)

This should be kept up by those who know these things. It is a very interesting point, a point which is obvious from his story that he was a discover and entirely his knowledge a result of concentrated interest.

Admirable comment on Page 72 between the mechanical slide-rule and the mental slide-rule. Gives an illustration which might very well go into this series of articles somewhere.

"I have never used a slide-rule, except for a short period in a more or less experimental way. In this short period referred to, I took up its use for a few weeks, some twenty-five years ago, but soon found that I was losing my quantitative sense and my faculty for mental computation. I found also that the figures and results were not retained

4
Lamme
for making ?

What Lamme saw from his experience was that the kind of training that the young men had had held back the leaders and pushed the laggards. He wanted to weed out or misapplications - using a manufacturing company term. A misapplied man might be highly successful as a salesman for today great technical knowledge is required, but he would never be an engineer.

Now I should say that here you have of the text book - educational text book - that is keeping George Westinghouse alive in the concern. It is an educational creed which men concerned with the basic things make them understand what they must look for in youth - what they must advise them.

And beginning at the bottom with the incoming worker on the automatics, those who punch and feed machines, who file letters, who like Lamme polished the brass. Everybody is interested in the newcomer. It might be a very dull boy or girl who does not know from the start in this concern that those and next to him - his foreman, his Superintendent - are interested in him. The plant is interested in him. In the first place they are interested in his health. He must stand a physical examination. He must report. If he has an accident he is looked after. It's the idea to those who are looking at him that ^{if} he has never had any training, penniless, has noticed for

mentally, as was formerly the case. After going into the matter carefully, I decided I was losing ground by the use of the slide-rule and so abandoned it, and I soon found that my former faculty for mental calculation was acquired again. On account of this experience, I have never again taken up the use of the slide-rule. No doubt for prolonged calculations along routine lines, the slide-rule will beat out mental computation; but, for my own particular class of work, where one is always feeling around trying to arrive at some special result, or is getting at relative results, the mental slide-rule apparently excels the mechanical slide rule. I find that it requires constant practice to maintain the mental method at high efficiency. In my earlier days, when overcrowded for time, many a time, when on a train, or street car, or in bed, or elsewhere, where paper could not be used, I have worked out in my head complete designs for new apparatus. In such cases, very often the work was even carried out in such complete detail that a full working specification, with all necessary data, was written out off-hand the next day without a particle of pencil calculation. The beauty of mental calculation is that the important figures and data are then kept in "mental stock," and can be drawn upon almost instantly when required - another feature which has been of extreme value in my work."

Westinghouse;

Lamme found out certain things in his efforts to train the youth under the engineering courses. As the concern grew and more and more technical students came into the various departments asking for training it became obvious that they must have a more systematic manner of handling them. That is, the rule-of-thumb would not do, so in all departments there gradually developed more or less scientific methods of taking care of men. Mr. Lamme's record, or account, of what happened in his field applies to what happened in all the different departments and the way he puts this down serves admirably as a guide in this all important matter of training young people.

He found in a few years, after he undertook a most systematic training, that a goodly percentage of the youths that presented themselves were hopeless - hopeless because they did not know, thought they might have been through college, had a good technical training in some special technical school, they really didn't know what they wanted to do, that is they had no decision.

Lamme reached this point of the weakness of the student body presenting itself. He made up his mind that he wouldn't accept anybody that had not shown some aptitude ~~and had~~ ~~and~~ early in life and had not experimented with it.

What he wanted in his department were boys that had tried their hands at mechanical apparatus. He laid it down as a rule that if a tendency is not there it is but little use to try to develop it or cultivate it; that a large percentage of young men who take up engineering courses in college are unfitted for the work and it is of course quite as true for those who take up manufacturing ~~and~~ commercial ends.

He wants the college ^{to} direct the youth, to help them find out what they want to do before they educate them. Now he says, we allow young men to educate themselves for a particular work and then find out after the education that he wasn't suitable for it.

He is hard on parents and schools and industries who could advise a boy for insisting on doing what his elder is right. He, himself, says he was constantly criticised as a boy for wasting valuable time in doing what we call, useless things

will be trying to invent - perfecting machine

he can begin to analyze and in Lamme's judgment it is only when he analyzes that there is hope for him. If he has none, he says, he is punk.

Lamme is immensely wise in what he says about the use of the imagination in the engineering profession. has come to For one who/believe from a long experience in life that nothing goes ahead very far without imagination. What he has to say is a comfort.

(Page 760 - quote)
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He believes/for the use of the imagination . it and he believes/for mathematics. The higher the structure is to be the stronger must be the foundation, says Lamme.

If he doesn't know his mathematics thoroughly he will never go far. They want higher mathematics.

He dosen't want a boy coming to him, saying he has specialized in this or that line in a college. If is he is a good analyst, if he/fairly skillful in mathematics, if he has the imaginative faculty that goes with it, has he initiative,, resourcefulness. is he a man of broad grasp of gēneral principles, rather than one who has made a special study of one induvidual output.

Now there is no one that has anything to do with any branch of our industrial life, nor has he got anything to do with publishing, with the writing profession, that does not know that here you have the soundest thought of principles

*even are principles and he never
sufficiently - teacher - think of having
the way*

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