FROM THE ENGINEERS

The staff of the **Red and White** is very grateful to the members of the Engineering faculty at St. Dunstan's, for in this issue they have taken it upon themselves to see that their faculty is well represented, and in doing this they have given the magazine no small amount of material. Without the contributions from the "Engineers", **Red and White** in all probability would not have put out its March issue.

Besides their keen interest in all topics concerned with their chosen profession, as a group, they are equally sharp in their criticism and condemnation of the other faculties on the campus. To them, Arts, Science and Commerce are all inferior. We have a feeling that one of their primary motives for supporting this issue of **Red and White** was to prove that, at least they are more interested in campus activities than are their counterparts. Perhaps, too, this contribution is an unspoken challenge.

A LETTER TO THE EDITOR

Deer Editor,

An enginer societie may sound Kweer on dis campis; but I'm glad we still got one. Wit a campis acustomed to the presents of such most powerfil and untelligent group in theas parts, namely Arts, won would tink the enginer societie woodn't have a chance.

Did ya ever stop, and ya gotta stop, to observe woo does all the wurk on dis campus. Anythin wort doin is done good by Artsmen, thats wat they said. So I stopped an I observed. I gess ders nothin much worth doin, because all the time I see an Artsmen, hees doin nothin.

Grantid us Engineers got the time, after twentie lekturs and five labs a week, however, it's nice to now the Artsmen are able to learn far mor than any others—any others—they didn't say what others. They clame too have a hier level of untelligence but have remayned mewt. Thank godness. One of there fellas tryed to right a letter and wadda mess.

The tyme has come though, thes artsman are comin out of the shadders. Are us engineers, us half educated elimint going to let this uneducated group come out of the shadders and imbarrus S. D. U? No, therefor at the next engineers meetin I will have sugessted the Artsmen go bak wher they com from, the shadders.

Yores sinserly,

Amember of the most powerful, well lit,
mobile and constructif group, namely Enginers.

KEY CONSIDERATIONS IN THE CHOICE OF ENGINEERING CAREERS

Most engineering students in their third year are beset with a very real problem—that of determining just what field of engineering to choose as their specialty. A St. Dunstan's student completing his five year course at Nova Scotia "Tech" has a choice of the following fields: Electrical, mechanical, civil, chemical, mining and metallurgical.

Modern thinking suggests a revised classification of engineering occupations. It would be a classification based upon the function which the engineer performs, rather than upon the field itself. In other words, it would stem from what kind of work he does, rather than what kind of things he works with.

This "functional" classification of engineering occupations would distinguish, first those engineers who are engaged in work at the research level (aimed at new products or methods for industry). There is another group whose functions is to develop and improve the design of existing products. These two groups work side by side with men trained in pure science and mathematics.

Other engineers are employed in the actual manufacturing processes and concern themselves with machine tools, time-motion studies, and assembly line techniques. Others work on sales staffs where they act as consulting engineers, serving customers by supplying free engineering advice toward the solution of their problems. Still another group of engineers is made up of those who specialize in construction work of various kinds—the building of bridges, dams, power projects, buildings, highways or railroads.

We may summarize this reclassification into three major functional groups: first, the **research** and **design** group, competing with men trained in pure science—physicists, chemists and mathematicans; second, the **technical** group, competing in the construction and manufacturing industries with men risen from the ranks of the skilled-workers and technicians; and third, the **managerial** group, competing for executive positions with men trained and experienced in business methods and management, in labor relations and personnel problems, in finance and law.

This enables us to appreciate how very difficult it is to design a single college course that will prepare a man for all of these jobs. It must be a course realistically designed to meet the needs of industry, yet short enough so that the young man's entry into an industry will not be unduly delayed; it must insist upon absolute mastery of basic scientific principles, if we are to produce sure-footed appliers of science and of the scientific method—only such men can be of service to industry and government. Yet the curriculum must restrict the content of theoretical science and mathematics. This must be done to find room for some introduction to the complex fields of engineering proper, in which such sciences find practical application. At the same time it must allow for broader subjects in the liberal arts and social science fields, enabling the engineer to function intelligently in areas beyond the strictly techincal.

At present we have a compromise course giving a common training to practically all engineers and depending upon industry itself and post graduate studies to supply any further specialized training.

AN ENGINEER

AN ENGINEERING PROBLEM

It has been brought to my attention several times since I began to study engineering, that the failure rate among engineering students is extremely high, much higher than in the other departments. I believe that considerably less than twenty-five percent of students in the Maritimes who take up the study of engineering finish with a Bachelor of Engineering degree. Most of the students who discontinue their studies do so because of failure, while a few quit for other reasons. What is the reason behind the appalling number of failures?

I certainly cannot give a complete and satisfactory answer to this question; however, I would like to express a few ideas concerning the problem and how it might be remedied. I say "problem" because that, to a certain extent, is what it amounts to. At present, our country has a shortage of engineers. If the number of those who graduate each year could be doubled, this shortage would soon become a surplus. Moreover, in this way, those with less ability and less desire for work would be weeded out, and, thus Canada would benefit somewhat.

Some people say that during the first two or three years of study in engineering, the chaff is separated from the grain, the chaff being those students who, because of failure or for some other reason, give up their hopes and becoming engineers. But is this true? I would say that many of those students who drop out have the desire to finish the course, but because of the presence of certain difficulties, most of which could be removed or at least remedied, they are not able to carry on their studies; or else they become doubtful as to whether they wish to continue. Yet, we cannot conclude from the fact that they quit that those students would not make good engineers. If the desire were there along with certain other qualities, it is likely that they could have completed the course and made as great a contribution to the engineering profession as did their classmates who made the grade.

If reasons for the failure of those students were known, the proper steps could be taken so that a higher percent would pass in the future. Some students really lack the necessary intelligence; however, this should not account for much more than ten percent, since the required intelligence is only a little above that of the average college student. Moreover, I think that before beginning engineering, the student usually feels that he is capable of passing it, but of course he must meet certain standards before he is allowed to begin.

The factor contributing most to failure is insufficient work on the part of the student. Some students let the days pass, and even the weeks, doing as little studying as possible. To some of these, this means nothing more than a week or two of hard, hard, work before each set of exams; but to the others, it means their downfall. Why is there a general atmosphere of indifference among these students? Who or what is to blame for the lack of interest?

Although the student is usually given the blame if he is not interested in his studies, I really don't think it is all his fault. He may blame it all on the faculty. Neither is this justified in every case, although some professors could certainly try to create more interest in engineering, among engineering students.

Especially at S.D.U. and places similar to this where no major engineering projects can be found nearby as a means of creating interest and providing knowledge for the students, professors should see to it that there is something to replace such sources of interest. Films, outside lectures, and reading could be used to good advantages as well as TV and radio.

Let us take a look at the subject of interest from a slightly different aspect. When a second or a third year engineer looks ahead, in many cases, he sees himself in a few years time with an engineering degree and very little practical experience. When he receives his degree he will most likely go to work with some company who will give him special training and pay him well at the same time. But, in the meantime, he has loads of time in which to lose his interest, since it is not easy to find work of an engineering nature. If, on the other hand, those same companies would hire during the summer months, more engineering students who are in their first or second years, give them as much training as they can handle, and pay them much less than they would have to pay graduates in engineering, the companies would be helping the students tremendously and they would also be getting some of their work done more cheaply. These companies could also offer a great deal more to the student by producing more films, books, and radio and TV programs dealing with engineering.

The students, thus given an insight into several phases of engineering work, would soon develop an interest in one field or another and consequently would work more diligently towards their goal.

—SANDY DONAHUE

BLACK GOLD TO B.T.U.'S *

(Engineers explore Campus Intricate Heating System)

One of the least noticeable buildings on our campus is the University power house. A small brick structure, it stands as a sentinel between the new rink and the Chapel, puffing black smoke in a long line over the horizon. But . . . there is something everyone takes for granted with never a thought—the vast and complex aspects which this sooty mechanical servant has associated with it.

Heating the buildings on a campus such as ours is a major undertaking. There is the heat required to keep all seven of them warm, as well as the steam that must be supplied for the laundry, and hot water for the showers and rink. If you think this does not require much steam, well . . . .

Let's look at the inside of the power house. There we will find three huge horizontal boilers: one of 200 horsepower and two others of 100 horsepower. The large boiler (200 H.P.), which was installed last fall, is capable of producing all the heat needed; therefore, it is the only unit operating during the winter months. In summer, one of the smaller (100 H.P.) boilers produces the reduced capacity needed during that period. At all times then, there are two spare units ready to take over in the event that the one in operation should fail. All three units are run using oil ("black gold").

Perhaps there are some reading this article who do not realize how much power is produced by those boilers. Well, think of your furnace at home, producing about one horsepower, then, compare it with those boilers producing 200 H.P., with a maximum capacity of 400 H.P., when all units are in operation. If that doesn't ring a bell, think of your father putting in several shovels of coal in the morning and a few more before going to bed. Here they burn 600 gallons of oil per day (equal to five tons of coal). Needless to say, considerable heat is produced.

* BRITISH THERMAL UNITS -

This heat, in turn, changes water into steam and maintains a boiler pressure of approximately 90 pounds per square inch (P.S.I.). Steam at this pressure travels to various parts of the campus through large pipes in underground tunnels. The electrical system and return lines (which carry the condensed steam back to the boilers) make use of these tunnels as well. The tunnels are easily spotted after a rain or light snowfall by dry patches on the campus.

When a steam line comes into a building, it first goes through an electrically operated control valve which increases or decreases the amount of steam beyond it. Next is a reducing valve which cuts the high boiler pressure (90 P.S.I.) down to about 6 P.S.I. (the pressure in your room radiator). These gadgets are shaped like flying saucers with a lever, a counterweight, and a myriad of pipes and fittings.

From the reducing valve, the steam goes directly to your radiator. On the inlet side of the radiator, there is a valve to turn the heat on and off. On the outlet side or bottom of the radiators there is an ingenious contraption called a thermostatic valve. Its purpose is to keep the steam in the radiator until it condense, (giving up its heat) allowing only the water to escape.

In each building the return lines lead down to a condensate tank in the basement. An electric pump forces the water from here to a large storage tank in the boiler house. Each building has one or more of these pumps. If you have been frequenting the library and had your cogitation interrupted by a whirring noise, well, that was one of these pumps efficiently keeping you warm.

Meanwhile back in the boiler house, another pump automatically starts when the water has been reduced to a certain level in the boilers. It pumps water from the storage tank into the boilers to be converted to steam again. If anything should happen to the electric power, a steam pump is ready to take over, so that no interruption in the heating cycle occurs.

Control Valves

That completes your vicarious journey around the heating cycle on the campus at S.D.U. Now, let us take a look at those electrical control valves we mentioned a while back. In all buildings, a bi-metallic thermostat on the wall in some strategic spot is set for a room temperature of 71 degrees F. This thermostat is wired to a relay which operates an electric motor—opening or closing the control valve.

Maybe you have speculated as to what that huge insulated tank was, when you passed through the basement of your building. Well, it is a tank supplying hot water for your showers and basins. The temperature of the water is automatically kept at 140 degrees F. (boiling water equals 212 degrees F.).

You will notice that, in our interesting trip around the campus heating system, nearly all the controls are automatic. This is in keeping with the progress of our times and is one way in which the college keeps expenses down and efficiency up.

It is not likely you will ever know how much time, thought, and energy went into this heating system, which enables you to study in comfort. (That is as it should be, for we live in a modern age.) However we, hope this brief excursion into the realm of engineering proved interesting. If it has, we would like to add that it is but one of the many, many "behind the scenes" fields in which engineers are performing every day for your convenience. It is but one of the good things we have at S.D.U. Let's appreciate them more?!

AN ENGINEER

CAUSEWAY A REALITY

The proposal of a giant causeway linking P. E. I. to the Mainland is indeed familiar to us. However, do we express anything more than a passing interest? Does it not contain a note of excitement? The amazing feat accomplished at Kitimat by the engineers was something of more than casual interest to all Canadians. The causeway may lack some of the grandeur that was Kitimat's, but it means much more to us.

Rumours of a causeway have been circulating for years, but only now from Government sources comes the assurance that the project will be undertaken. Many things must be considered, and much work must be done before the actual construction is begun.

For the purpose of adequately discussing the preliminary investigations concerned and the actual construction of such a project, let us sketch a brief analysis of what it really will be.

A causeway will mean filling in the Strait with rock and sand, to form a highway. There will also be the necessity of locks to alleviate the pressure of changing tides.

Economically speaking, the investigation is concerned with the problem of building the least expensive, but most satisfactory causeway link. Factors to be taken into consideration include the source of material, the equipment used, and the time required to complete the job.

The problem concerning the source of material has been solved. A supply of suitable rock on the Mainland near the proposed site has been found. The rock was tested for breaking in a test pit by boring down approximately fifty feet, and planting charges.

The Hydrographic Branch of the Department of Mines and Technical Surveys completed an extensive survey over a large area

You will notice that, in our interesting trip around the campus heating system, nearly all the controls are automatic. This is in keeping with the progress of our times and is one way in which the college keeps expenses down and efficiency up.

It is not likely you will ever know how much time, thought, and energy went into this heating system, which enables you to study in comfort. (That is as it should be, for we live in a modern age.) However we, hope this brief excursion into the realm of engineering proved interesting. If it has, we would like to add that it is but one of the many, many "behind the scenes" fields in which engineers are performing every day for your convenience. It is but one of the good things we have at S.D.U. Let's appreciate them more?!

AN ENGINEER

CAUSEWAY A REALITY

The proposal of a giant causeway linking P. E. I. to the Mainland is indeed familiar to us. However, do we express anything more than a passing interest? Does it not contain a note of excitement? The amazing feat accomplished at Kitimat by the engineers was something of more than casual interest to all Canadians. The causeway may lack some of the grandeur that was Kitimat's, but it means much more to us.

Rumours of a causeway have been circulating for years, but only now from Government sources comes the assurance that the project will be undertaken. Many things must be considered, and much work must be done before the actual construction is begun.

For the purpose of adequately discussing the preliminary investigations concerned and the actual construction of such a project, let us sketch a brief analysis of what it really will be.

A causeway will mean filling in the Strait with rock and sand, to form a highway. There will also be the necessity of locks to alleviate the pressure of changing tides.

Economically speaking, the investigation is concerned with the problem of building the least expensive, but most satisfactory causeway link. Factors to be taken into consideration include the source of material, the equipment used, and the time required to complete the job.

The problem concerning the source of material has been solved. A supply of suitable rock on the Mainland near the proposed site has been found. The rock was tested for breaking in a test pit by boring down approximately fifty feet, and planting charges.

The Hydrographic Branch of the Department of Mines and Technical Surveys completed an extensive survey over a large area probability of a new ferry. Once the causeway is finished, the only costs would be those of maintenance. Furthermore, much of this financial burden may be alleviated by a toll system.

Political circumstances themselves give an added impetus to the optimistic view of the reality of the project. The government at the present time is favouring and promoting large projects in the light of the unemployment situation and economic security. Would this not be a boon to labour? This follows even more closely with the government's program to help the Maritimes, especially in communications. Needless to say, the Conservative Government would be anxious to take the credit of completing this endeavour.

The causeway, regardless of how you consider it, presents itself as an interesting topic; however, we naturally say, "what are we going to get out of it?" The answer is self-explanatory. Improved transportation would naturally benefit the Island economy. Our products could be moved faster and more efficiently towards their markets on the Mainland. The movement of goods into the province would also be greatly facilitated. The tourist trade, which is truly an industry here, would without doubt increase considerably, bringing more money to our Province. This is a matter of conjecture, but it is a possibility that along with the causeway may come a cheaper source of electricity.

In conclusion, I would like to point out that this link between P. E. I. and the Mainland would be a fulfilment of the pledge Canada gave at Confederation—to provide "continuous communication" with the Mainland.

(Appreciation is extended to Mr. Clive Currie, District Engineer for P. E. I. who kindly supplied information for the above article.)

—NORMAN KANE

Heaven

Is as the book of God before thee set,
Wherein to read his wondrous works.

—Milton