The School Magazine

OF THE

McCABE COMMERCIAL SCHOOL

MAIDSTONE

Vol. 1. No. 2.

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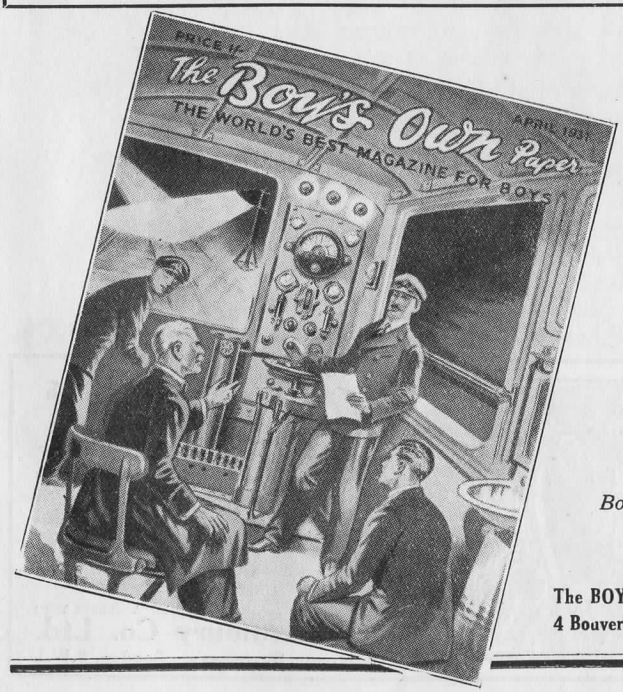

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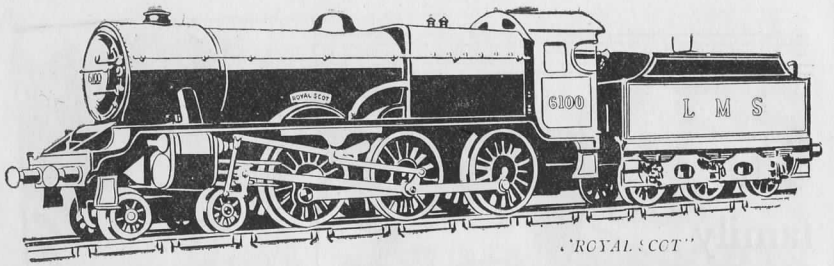

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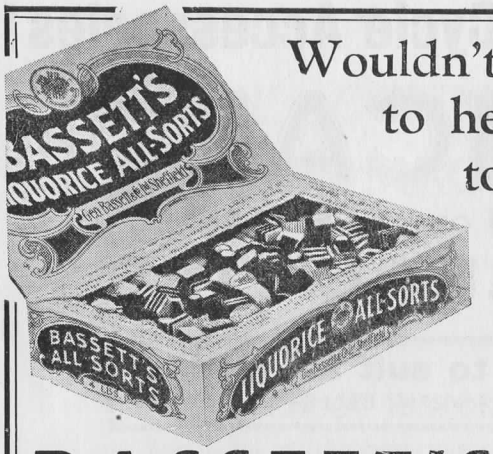

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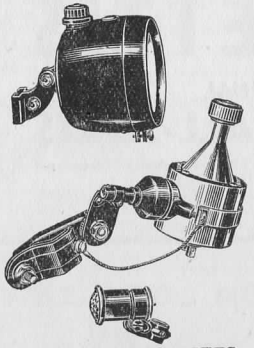

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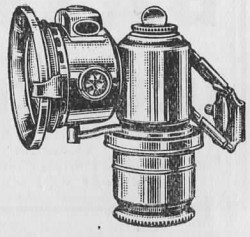

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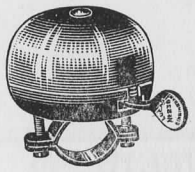

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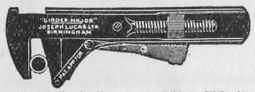

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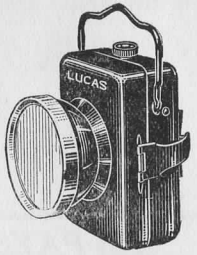

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McCABE COMMERCIAL SCHOOL MAGAZINE

VOL. 1. NO. 2. MARCH, 1931.

SCHOOL HISTORY.

Our first issue of this magazine proved such a success that we are encouraged to persevere with the venture. So many extra copies were requested by Old Boys and parents that our present order to the printer has had to be increased by another 50 copies.

* * * *

The School Calendar is as follows :—

Wednesday, 22nd April.—Summer Term begins.
Monday, 25th May.—Whit-Monday.
Monday, 9th June.—Half-Term.
Monday, 13th July.—Cambridge Local Examinations.
Friday, 24th July.—Summer Term ends.
Wednesday, 16th September.—Christmas Term begins.

* * * *

By the time that this issue is published we hope that the memorial photograph of Mr. McCabe will have been unveiled in the large schoolroom. Mr. McCabe's 75th birthday would have fallen on Thursday, 26th March, and this date has been suggested as an appropriate day for the unveiling ceremony.

* * * *

This term we have to record a change upon the staff. Mr. R. L. Marshall, M.A., has left us to resume a post at Muncaster School, Ashford, Middlesex, where he spent some time before coming to Maidstone. We wish him every success and good health. His place has been taken by Mr. A. H. Wallace, B.A., who comes to us from Derby. Mr. Wallace has a First Class Honours History degree at London

University and has already displayed a very keen interest in the work and corporate life of the School.

The new boys this term are: D. C. Potts, Va; R. H. Pearce, III; I. H. Thorpe, III; K. Bonner, Prep.; D. A. Reynolds, Prep.; E. C. Locke, IVb; E. Shaw, IVb; R. Yuill, III.

* * * *

F. N. Randall has left School to take a post at Messrs. Roote's at Rochester. M. A. Langley has obtained a position in the office of Messrs. Taylor & Co., Millers, of Bank Street.

L. H. Pearce has gone into his father's business of a manufacturing confectioner.

L. C. Morgan has obtained a post with Messrs. Alabaster, Passmore and Sons, printers, Tovil.

J. K. Woollard is learning farming at Wateringbury.

R. C. Eagleton has left on account of delicate health.

* * * *

A. Croucher has been away nearly all the term as a result of an operation for appendicitis. We understand he is going on satisfactorily and hope to see him again next term.

* * * *

The list of text-books in daily use has now been thoroughly overhauled and the transfer to modern books and methods is now practically complete. No effort has been spared in getting the best text-books, at a reasonable price, in the various subjects and the pile of publishers' catalogues and specimen copies now being accumulated is assuming mammoth proportions.

* * * *

We hope to have a good entry of boys for the Cambridge Local Examinations in July. These boys have been doing some very good work and we wish them every success.

* * * *

The arrangements for taking Typewriting have now been completed, and lessons are already being given. In conjunction with Shorthand and Bookkeeping this subject will prove valuable to the older boys, and a knowledge of these subjects often proves just sufficient to turn the scale in the applicant's favour when seeking a post as soon as school-days are over.

A new piano has just been secured, and instrumental music is now being taught to boys who wish to learn music. Miss D. Stubbs, A.L.C.M., is responsible for the teaching, and boys whose parents wish them to take music should give in their names as soon as possible in order that suitable times can be arranged. Two pupils have already started.

* * * *

The School boxes this term contained 5s. in the West Kent General Hospital box, and 10d. in the R.S.P.C.A. box. A quantity of tin-foil has again been collected and about 7 lbs. have been handed over to the hospital.

* * * *

The Hollingworth Hall has been hired this term for the Drill and Physical Exercises. Much good work has been done, and the lessons have been much appreciated by the boys.

* * * *

We have had difficulty in obtaining a suitable cricket field for the summer now that we are no longer able to use the ground belonging to the Maidstone Gas Co. We are seeking a field convenient to the School and one where the charges are not to exorbitant. If any friend knows of such a ground, we shall be very grateful to receive the information.

* * * *

The School is now on the telephone. The number is Maidstone 2623. The installation is a great convenience and has already saved a great deal of valuable time.

* * * *

An excellent debate was held this term and both sides were very adequately presented. The motion that a portion of the money now spent on aeroplanes ought to be used for the perfection of airships was lost by 27 to 6. The speakers for the motion were Bowler, Tolputt, Finn and Apps. The opposers were A. Harman, F. Harman, Bodiam and Elbourn.

A budding historian informs us that "Philip was on Mary's side but was forced to agree with the execution by marriage."

* * * *

The School Library continues to flourish amazingly. Nearly every boy is a member of the library, which is steadily growing and provides reading for all varieties of taste though tales of school-life and of adventure seem the most favoured. Books have been presented by G. Stone, K. Wills, L. Reynolds, S. Farman, J. Piper, J. Beale, R. Yuill, Mr. Piper, I. Thorpe, W. Spurgeon, G. Goodchild, J. Elbourn, Mr. McCabe, H. Bradford, P. Bowler, R. Bodiam, L. Morgan.

We are indebted to Mrs. W. Beale for her kindness in repairing several of the damaged volumes.

* * * *

The suggestion has been made that the Old Boys' Club should be revived, and a number of Old Boys have expressed their willingness to become members. As soon as sufficient names are obtained steps will be taken to give the Club a flourishing start. Pending the appointment of officials, names may be left at School.

F. H. Tolputt.

PRIZE DAY.

The following account of the Prize-Giving on 19th December is reprinted from the "Kent Messenger."

At the prize distribution at the McCabe Commercial School on Friday, several touching tributes were paid to the memory of the late Mr. W. J. McCabe, founder and first principal of the School.

The Rev. C. W. Martyn, Vicar of St. Peter's, who distributed the prizes, said that he regarded the McCabe Commercial School with special affection, coming as it did within the parish in which Mr. McCabe had done so much good work. He was pleased to find the School so full of vitality and he was certain that the new Principal, Mr. H. I. Piper, with his knowledge of modern methods of education, had the good of the School entirely at heart, and would infuse into it the right public school *esprit de corps*.

Mr. Piper said that the School was being re-organized in several directions and that the School curriculum was now based on the Cambridge Local Examinations, the London Matriculation and also Pitman's Shorthand Examinations. The Preparatory department had been re-opened under Miss Stubbs, and he was very pleased with the work of this part of the School. He realized the difficulty of maintaining the high standard of work which Mr. McCabe had set, but hard work hurt no one and without high aims nothing could be accomplished.

Mr. Ardontz said that the French was quite good in the School, and showed that the boys had brains. With further perseverance he hoped for good results.

Mr. R. L. Marshall, who is leaving to take up an appointment at Ashford, Middlesex, said that although he had served under many Headmasters he had never met a more sympathetic and just man than the late Mr. McCabe. He wished the School every success.

The Captain of the School, W. Beale, asked Mr. Martyn to present to various members of the staff a small token of the boys' good wishes. After the recipients had suitably replied, cheers were given and the School dispersed for the Christmas holidays until Tuesday, January 13th.

THE PRIZE LIST.

Captain's Challenge Cup for the year, W. Beale.

Upper Fifth Form.—Form prize, Easter, F. N. Randall; Christmas, W. Beale; top in exams., Easter, F. H. Tolputt; Summer, M. A. Langley; good work, S. Reynolds; mapping, S. Reynolds; penmanship, J. K. Woollard and R. H. Ashby.

Lower Fifth Form.—Top in exams., Easter, B. W. Finn; Christmas, P. E. Hinton; Form prize, E. B. Bowler; good work, F. Harman.

Upper Fourth Form.—Form prize, Easter, L. H. Pearce; Summer, W. G. Apps; Christmas, E. Butler; good work, F. H. E. Vidler; mapping, R. E. Bushby.

Lower Fourth Form.—Form prize, Summer, S. Beale and A. S. Croucher; Christmas, H. Philpott; drawing, G. S. Haywood.

Upper Third Form.—Form prize, Easter, L. Morgan, Christmas, L. Beale; good work, R. W. Randall.

Lower Third Form.—Form prize, P. Randall.

Preparatory.—Good progress, W. Jones, D. Winder, P. Spencer, S. Farman, D. Spencer and N. Sturt.

SCHOOL CERTIFICATES.

Upper Fifth Form.—F. H. Tolputt, examination work; F. W. Walkling, good progress. Lower Fifth Form.—E. B. Bowler, good progress. Upper Fourth Form.—E. Butler and W. S. Spurgeon, good progress, L. C. Morgan, mapping. Lower Fourth Form.—S. Beale, R. J. Harle, good progress; G. H. Stone, K. H. Whibley, mapping. Upper Third Form.—R. S. Eagleton, good progress. Lower Third Form.—P. Randall, good progress.

Football Challenge Cup.—Town Team, Captain, W. Beale.

FOOTBALL.

The matches played since our last issue have resulted as follows:—

20th Dec.	Ryarsh Scouts.	Away.	Draw, 3—3.
24th Jan.	Technical School.	Home.	Lost, 16—1.
7th Feb.	St. Peter's Rovers.	Home.	Won, 3—0.
16th Feb.	St. Michael's School.	Away.	Lost, 4—1.
7th Mar.	North Ward.	Home.	Lost, 3—2.
21st Mar.	Boxley Scouts.	Away.	Won, 5—0.

The total results for the season are:—

				Goals	
Played	Won	Lost	Drawn	for	against
12	3	7	2	39	60

Caps have been awarded to the following: W. Beale (Capt.), R. Ashby (Vice-Capt.), H. Bradford, S. Beale, L. Beale, L. Pearce, S. Reynolds, P. Hinton, H. Pearce.

W. Beale (*Capt.*).
G. Lynn (*Hon. Sec.*).

CHARACTER.

(While turning out a drawer recently the following notes were discovered on a few loose sheets from a note book. The writing bore no signature but I recognised at a glance the neat handwriting of Mr. McCabe.)

A man's character is generally formed in the first twenty years of his life. In some degree it is influenced by his associations and environment; in some degree perhaps by heredity; in some degree by Education. But all these are only small influences compared with the measure that a man's own definite purpose, his own will, his own clear sight of right and wrong, his own physical, and especially his own moral courage have in the determination of what his character is to be.

Let a young man come finally to accept, and realize, and estimate at its true value the fact that his life is bound to be of his own making and that it can be, in spite of all doubters and objectors, just as great a life as any one's life. If he is determinted enough about it, then he has formed for himself a character that will carry him far.

Essentials of Character.

The first thing in his business life is probity; the first thing in his domestic life is sound affection; the first thing in his spiritual life is an unswerving belief in the inspired World of God and in the value of his own soul.

Given such a man as this, so equipped, instil into him a desire to be of service to the world—and there is nothing that may be denied him: he'll succeed.

"Take the first road to the right and do something" will be the quest of his Knighthood.

But let a young man grow up failing to believe in himself, with a vague idea "that things will come out all right," with the confidence that friends will see to getting him a place, that relatives will support him in business, with the idea that he may make a lucky fortune by speculation, and with a disregard to the importance of his own manhood—and the character engraven on that man's soul is but a smudging blur that means little or nothing.

He becomes a mediocre clerk or man of business and throughout his life may be heard complaining, "that he hasn't been given the proper chance," but he never gives the true reason.

PETROL.

How common yet important petrol has come to be, few of us realise, though most of us are daily dependent in a measure on its usage. Its production and distribution give employment to considerable numbers of men in different parts of the world, oil wells, from which petrol is obtained being found as far apart as Mexico and Burma. The same process, however, has to be employed to render the output of these underground lakes, tapped by human ingenuity, beneficial to mankind.

The crude petroleum which sometimes gushes up, is run into large storage tanks and thence conveyed to the refineries often miles away.

The cost of its transportation has been greatly reduced by the method employed to convey it, namely: the pipe-line system which has entirely superceded other means and involves the maintenance of miles of great steel tubes.

At the refineries the crude petroleum which goes in as a thick brown sludgy substance is distilled and the products condensed separately. This process is known as the "cracking process" and is carried out as follows: The "crude" is brought to a temperature which is the vapourising point of the component desired.

Light naphthas or petrol constituents vapourise at a temperature which scarcely scalds the skin. The oil is kept at the same temperature until all the naphthas are given off and the petrol can be condensed separately.

Then the temperature can be raised to the kerosene "boiling point" and held there until the kerosene constituents have been driven off, and so on until all that can be utilised is extracted. The residue, even, is not wasted, our great liners and warships using it for fuel. The light naphthas yield aviation petrol, and intermediate naphtha the ordinary petrol used in motor cars. The heavy naphtha, commonly known as benzine, is used in cleaning and in making paints and varnishes.

The next fractions give respectively, illuminating oil and gas oil. The last and heaviest, yields paraffin wax and various lubricants.

The greater use of petrol has been rendered necessary and has grown to its present dimensions by the constantly increasing utilisation of the internal combustion engine, whose range varies from great dynamos and submarine engines, to aeroplanes and the tiny outboard motor-boats. The rapidity with which modern transport has progressed is mainly due to this using of nature's stored up energies.

D. Potts.

Careers for Boys.

STRUCTURAL ENGINEERING.

Writing the Story of the Age in Stone and Steel.

One hundred years ago to describe oneself as an Engineer was to convey a fairly definite impression as to the kind of work one was fitted to perform. To be told that such and such a person is an Engineer to-day is not very helpful. The Engineering profession is now divided into so many subdivisions that it has really become a group of professions. Whilst it is true that many of them are so closely allied that a man trained and experienced in one might with ease undertake work in another, yet there are many so severely specialized that they form a life's study in themselves.

Broadly speaking, Engineering has become divided into two large groups—Civil and Military Engineering. The first is the more important since it provides a great deal of the scientific and technical knowledge for the latter. In this, the Civil Engineering Group, are to be found such important branches of the profession as Mechanical, Electrical, Structural, Mining, Metallurgical Mining (the study of metals), Naval, Water Power and Supply, Marine, Municipal, Sanitary, Gas and Chemical Engineering. Each of these is a specialized vocation. If you think you have discovered a coal seam in your garden, it is of little use calling in a Mechanical Engineer. You might just as well call in a Surgeon for all the help he could give you. It is the Mining Engineer you require. In developing your coal seam you would doubtless require the services of many branches of the Civil Engineering profession, but you would find each trained for some particular part of its development.

Some of the branches we have enumerated are fairly closely allied to each other. One frequently finds, for example, that a Mechanical Engineer will possess quite an extensive knowledge of Electricity. Water and Sanitary Engineering are closely allied, as are Naval, Marine and Structural Engineering.

In this article we are concerned with Structural Engineering, fast becoming a very important profession.

A definition of Structural Engineering.

The Institution of Structural Engineers has defined our subject as treating of the Science and Art of Engineering, as applied to Static Structures. In more simple words, the Structural Engineer is concerned with the planning, design

and construction of structures built with concrete, reinforced concrete, steelwork, brickwork, masonry, and timber; and the knowledge of the properties and use of these and other materials of construction.

The sub-divisions of Structural Engineering.

This again has become so complicated in modern times that we find men concentrating much of their attention upon various sub-divisions. Thus there are already specialists in steel buildings; in concrete buildings; concrete bridges; silos; colliery headgears, gantries and bunkers; reinforced concrete retaining walls and dams; and reinforced concrete water towers. These are but a few. The services of Structural Enginners are in constant demand whenever chemical and metallurgical establishments are being planned and equipped. The general engineer is giving way to the specialized engineer. The sub-divisions enumerated above will doubtless in time give place to others. At the moment steel and concrete play a major part in the fabric of our buildings. Who knows but that at some early date a new and efficient substitute may be found, necessitating a complete change in our methods of building?

Shall I become an Engineer?

How are we to know whether or not we have the qualifications necessary for the pursuit of Civil Engineering? We cannot know for certain. We can, however, lay it down as a maxim that no boy should enter the profession unless he is keenly interested in matters relating to engineering. It is comparatively simple to ascertain whether or not the average boy is interested in such matters. Most boys have opportunities of testing their interest in engines, and it is fairly safe to say that the child who enjoys dismantling and re-assembling an engine will find branches of engineering other than Mechanical Engineering of equal interest.

The important and difficult problem is the test of aptitude. Keenness without ability will not carry us very far. How can we decide on this question of aptitude?

In youth it is perhaps indicated by a tendency to illustrate ideas or record impressions by means of sketches; and a more than usual interest in the practical application of mathematics. These two tendencies will not, of course, be expressed in anything but a simple manner. The boy who delights in "scribbling" with his pencil shows a marked tendency towards the former; whilst the latter shows itself in a general keenness for working out problems in arithmetic, algebra, and so on.

School Days—and After.

We have passed beyond the age when success in engineering depended mainly on personal influence. It has now become an exact science, with a great deal of study to be undertaken before mastery can be claimed.

Nowadays this necessary knowledge can be gained at but little cost; but before passing on to the means of acquiring technical knowledge, we will glance briefly at some of the subjects taught in schools that form a very useful background for the more specialized study ahead. They are as follows :—

History.
Geography.
English Composition and Literature.
Arithmetic.
Algebra.
Trigonometry.
Geometry.
Mechanics.
Physics.
Chemistry.
Mechanical and Geometrical Drawing.
One at least of the three Modern Languages :—French, German, Spanish.

Mechanics, Physics, Chemistry and Mechanical and Geometrical Drawing should interest the boy who wishes to become a Structural Engineer. If they are not included in the school curriculum they will be found to be most fascinating hobbies and great fun to learn in one's spare time.

Technical Training.

On leaving school there are three ways open for the acquisition of the requisite technical knowledge. These are :—

(*a*) Full-time University or Technical College Training.
(*b*) Articled Pupilage; and
(*c*) Attendance at Evening Classes.

We will take each of these in turn.

(*a*) *Full time University or Technical College Training.*

On leaving school, one year's general engineering training should be pursued to include the following subjects :—Machine Drawing and Design, Solid Geometry, Mathematics, Graphics, Mechanics, Heat, Magnetism, and Electricity—with the proper laboratory and workshop practice associated with these subjects.

Whilst studying the above it should be possible for the student to judge which of them he finds of greatest interest. This is important, since from now onwards his studies will tend to become more and more specialized, and it would be a pity to waste further time on subjects that may be of little value later on.

The University or Technical College student who intends to specialize in Structural Engineering will, after the preliminary year described above, select that course which most closely deals with the desired line of study. The following subjects are absolutely essential :—

Mathematics.
Theory of Structures.
Building Construction.
Strength and Properties of Materials (with special reference to steel and concrete).
Structural Drafting.
Graphic Statics.
Specifications and Quantities.
Steel Construction, as applied to steel buildings, bridges, roofs, crane gantries, colliery headgears, bunkers, elevators and conveyors, elevated steel and cast-iron tanks and water-towers.
Principles of reinforced concrete construction, and their application to the design of foundations, buildings, culverts, roofs, domes, jetties, headgears, bunkers, silos, tanks, pipe-lines, retaining walls and dams.

There are several very desirable accessory subjects, such as Hydraulics (study of water power), Surveying and setting-out of new works, and a reasonable knowledge of Architecture and Aesthetics in regard to buildings and bridges.

The whole of the above syllabus would not be covered in the two or three years' University or Technical College course. A great deal of valuable information will, however, be picked up by the keen and intelligent student with regard to the principles underlying the structures we have named.

The student adopting this method of entering the profession will have to make his own opportunities of seeing works in progress. Busy and interesting holidays could be spent visiting large buildings in course of erection and systematically making notes of useful details of their construction.

Most Universities grant both Diplomas and Degrees in Engineering; and many Polytechnics and Technical Colleges have courses designed for a Diploma. It should be noted that a Degree cannot be obtained except after Matriculation, whereas a Diploma is awarded without this Matriculation qualification. In recent years employers have shown a marked preference for holders of Degrees, and the wise boy will go "all out" during his school days to Matriculate.

A further advantage of the Degree as compared with the Diploma is that it facilitates entry into the professional engineering societies.

This question of the Matriculation is of first-rate importance. Without it the student may have to waste a whole year after leaving school revising normal school subjects in order to Matriculate.

Before deciding which subjects to take if his examination has not yet been passed, care should be taken to relate all possible subjects to those we have suggested are necessary to the Engineer.

(b) *Articled Pupilage.*

Under this system the boy, on leaving school, is received in the offices of an established Engineer. An arrangement is made whereby on payment of an agreed sum, the Engineer agrees to coach the student in his work. The period of apprenticeship usually extends to three years, and during this time the student is brought into direct contact with actual engineering problems.

The contract between the parent or guardian of the boy and the principal of the firm is a legal one. Sometimes a clause is inserted whereby the premium, or part thereof, is paid back to the apprentice in the form of salary over a number of years. Also it is usual for a clause to be inserted allowing for the student to have time off to attend classes at a University or Technical College.

When the period of pupilage is over the student may be taken on to the permanent staff of the firm as a paid assistant. Failing this, he will have to use whatever influence he possesses to obtain paid employment in another firm.

There are arguments for and against this method of acquiring technical efficiency. A debate was recently organized at the Institute of Structural Engineers on the relative merits of Articled Pupilage and University or Technical College Training, and the latter was found to be the most popular.

There has been considerable abuse of the Articled Pupilage system in the Engineering, as in other professions. Premiums have been paid and very little attention has been given to the needs of the pupils. Further, employers on the

whole favour the University man as opposed to the apprentice, and are usually prepared to pay rather more for his services.

Against this the apprentice who is fortunate in his choice of a firm gets into touch with the practical details of the job much more rapidly than does the University or College man. He also commences to draw a salary earlier.

It should be borne in mind that the Articled Pupil, at the termination of his pupilage, is without a Degree (unless meanwhile he has graduated as an external student at some University); and so will still be required to take both the Preliminary and Final Examinations for Associate Membership of the various Engineering Institutes. The holder of a Degree in Engineering is exempt from at least the Preliminary Examination.

(c) *Attendance at Evening Classes.*

Now for the boy whose parents are not able to afford an expensive training.

Many successful Engineers have commenced their careers at the age of fifteen or thereabouts as paid clerks in the drawing offices of engineering firms. In the evenings they have managed to obtain proficiency in the profession by attending evening classes.

This is an uphill fight, and requires much grit and determination. Many, however, have achieved eminence in the profession through such a humble beginning. The boy who must adopt this method should watch the advertisement columns of the various Engineering papers for openings.

The boy whose parents are unable to afford an expensive technical education can take comfort from the fact that Telford, Brunel and Locke—three of England's greatest engineers—started in a very humble way. They did not enjoy what has been described as "the dubious advantage of abstrusive mathematical knowledge." Against this, however, we may set the definition of a witty American, that an Engineer is "any fool who can put up a building that will not fall down."

The Institute of Structural Engineers.

Most professions nowadays have their own Institute concerning itself with promoting the interests of its own members. The Institute of Structural Engineers is such an Institute, and sets the standard of efficiency for men entering the profession. This it does by offering its associate and full membership only to those who have passed certain examinations.

These examinations are known as the Preliminary (sometimes known as Graduateship) and Associate Membership of the Institute of Structural Engineers (the Final). We have already pointed out that exemption from the first of these is usually granted to holders of a University Matriculation Certificate, or its equivalent if certain specified subjects have been taken.

When Examinations are Over.

The Institute gives the following as the three main avenues along which the fully-fledged Engineer will proceed:—

(1) *Service with a private firm.*
(2) *The public service; and*
(3) *Private practice.*

(1) *Serving with a Private Firm.*

Considering first what is probably the aim of the majority—the occupation of a post as Assistant in a firm—either a private firm of Consulting (Structural) Engineers, or with a firm of Contractors which carries out Structural Engineering work. Either of these openings will provide ample opportunities for acquiring valuable experience both in the design and execution of works. If any distinction may be drawn between these classes of employment, service with a contracting firm will probably furnish more frequent opportunities of being out on actual works and of becoming familiar with the thousand and one details connected with demolitions, preparation of site, organization of workmen and plant, ordering of materials, emergency methods of meeting unforeseen difficulties and clearing up on completion of contract. On the other hand the work in a Consulting Engineer's office includes not only the designs in detail, but considerations leading to the laying out of schemes as a whole, and the supervision and direction of the works during construction. In either case a sound working knowledge is always a useful asset and enhances considerably the value of an assistant to his employers.

(2) *The Public Service.*

The second opening for the young engineer mentioned above is called "the public service." This includes work in the Civil Service, the Colonial Service, and work for public, local and municipal committees, councils, boroughs, and

other authorities. In, at any rate, the first two services mentioned, the young practitioner may rise through various grades of responsibility as an Assistant, to a position equal in point of fact to that of the man in private practice; whilst many may prefer to occupy such a position rather than go into private practice, on account of the inducements offered by security of tenure and income, and the probable prospect of a pension—though it can hardly be admitted that the latter was ever a real attraction to an ambitious man. Positions in the Civil Service are usually gained by examination; and the possession of an Engineering Degree, and very often of membership of a recognized professional institution, is frequently essential. Full particulars can be obtained from the Civil Service Commissioners, Whitehall, S.W.1. Positions in the Colonial Service (or in the P.W.D.) are usually advertised in the first instance by the Crown Agents for the Colonies, Millbank, London, S.W. Any candidate who is an Associate Member of the Institution of Structural Engineers receives due consideration for any structural engineering position; and indeed more than one hundred members of the Institution are already serving in the P.W.D. in various parts of the world.

With regard to employment as Assistant to a Municipal, County, or Borough Engineer (with the ambition, presumably, of subsequently becoming the holder of the principal position), such posts are frequently taken up directly from the schools, and carry, as a rule, a fair salary.

(3) *Private Practice.*

Although private practice will probably be the ultimate aim of every ambitious young student, it is rarely indeed that he will venture into it before serving for a considerable period as an Assistant.

THE MAGIC BALLOON.

Once upon a time there were two little boys. Their names were Jim and Jack. Now Jack had to go shopping for his mother and while going through the wood he saw a lovely balloon an old witch had left there. He took it home and asked his mother if Jim could come and see how high it would fly.

While they were flying the balloon it suddenly got so big that they had to leave go and they found it had tangled itself round the chimney pot and was carrying the house away. After it they went, right through the wood. Suddenly they noticed a cottage with an old lady at the door. Going up to her they asked if she would get the house back for them as their mother was inside it. The old lady was the witch, so she only laughed and sent them on their way.

Presently they met a woodcutter and told him their sad story. He said he would help them, so gathering up some wood he set off for the witch's house and gave her the wood to make a fire with. When the wood started to burn it gave out a lovely smell which sent her to sleep.

"Now," said the woodcutter, "run home and you will find your house is quite safe." Away went the two boys and you may be sure they were ever so pleased to see their mother again and they promised they would never bring home another magic balloon.

DERRICK REYNOLDS (age 8.)

MODEL RAILWAYS.

Model railways have advanced enormously in late years. The only loco's obtainable 25 years ago were little steam engines, possessing no safety valve, throttle, reverse gear, or anything of that description, so that once you had steam up, you had to let her rattle round the track, at a scale speed of 100 m.p.h., or else the boiler blew up! Also there were hardly two engines with the same gauge, so that if you had six engines, you had to have six sets of rail!

Now, owing to the energy of four or five firms, model railways have developed from unreliable toys to very complete models, and one can now buy loco's only 6 inches high, which will haul ten people. Some of these engines are correct in every detail down to dry and wet sand pipes, an $\frac{1}{8}$ inch in diameter, which really work!

One famous model engineer constructed a 1¼ inch gauge steam loco, " Sir Morris de Cowley," which pulled three people along at quite a fast pace. Another engineer made a steam engine, fitted with dummy slide valve cylinders and valve gear, real displacement lubricating, and worked by an oscillating cylinder inside the cab, only 3 inches in length and about 1½ inches high !

The chief drawback to the clockwork engine is the speed, most of them going much too fast. It does not look very realistic to see a shunting engine in a goods yard travelling at a scale speed of 80 m.p.h., but this has been overcome at last by a sort of governor. Everyone knows the governor in a gramophne, two collars on a shaft, one fast and the other loose, connected by two lengths of clock spring, and in the middle of the springs, weights are secured, so that when the shaft rotates, the weights fly out and cause the loose collar to approach the other, and the faster the shaft turns, the nearer the collars get. At the side there is a fibre block which stops the collars getting too near, and thereby governs the speed. It is nearly the same in the clockwork mechanism, the block being adjustable by means of a threaded rod.

In the late Sir Henry Segrave's model railway, which is of 1¼ inch gauge, he imagined a Channel Tunnel, and ran the line from London, through the Tunnel, through France and into Germany.

On this model railway, there are about forty engines, far too many for the rolling stock.

The chief charm about a model railway is that it is the real thing in miniature, and the real thing has a sort of lure, there are not many people who can resist looking at an express thundering along the track. P. Hinton.

HOW COAL GAS IS MADE.

The "Gas Light and Coke Co.'s" works at Beckton, are the largest in the world. Nearly 5,000 tons of coal are used daily to make over 75,000,000 cubic feet of that wonderful gas which lights and heats so many homes every day of our lives !

When the coal arrives at the works, the trucks are placed in revolving frames which turn them over bodily, pouring the coal on to an endless chain conveyor which carries it into the works.

The coal is then placed in air-tight retorts or ovens, and heated in a temperature of 1,325 degrees Centigrade. The gas is then driven off to be purified.

The coal is placed in the retorts by an electrically operated machine called a "charger"; as it moves along, the retort doors are automatically opened and the coal is shot in. There are many types of charges. Nowadays coal gas is mixed with another gas—carbon monoxide—a poisonous gas, with no taste, no smell, and impossible to be seen. Steam is passed over red-hot coke, with the result that hydrogen and carbon monoxide are formed, these two gases when mixed are called water gas. To draw the gas from one part of the works, a very powerful exhaust is needed. When the gas is ready it is pumped through London at 3,000,000 cubic feet an hour.

When the gas has been extracted from the coal, coke is left, and as this is emptied from the retorts, it is cooled and carried away by an endless chain conveyor, which empties it into a heap, or on railway trucks or carts as required.

E. Shaw.

" CROOKS CAUGHT BY FINGERPRINTS."

Hundreds of criminals have been brought to justice as a result of the wonderful system used at the Scotland Yard Fingerprint Bureau.

It is uncanny ! For instance, one day a detective was on the trail of a suspected criminal, and followed him into a restaurant where the criminal left his fingerprints on a knife and fork.

They were rather peculiar prints, and on investigation were recognised. The man was taken to Scotland Yard.

In a private room his fingerprints were taken. The great files of the Yard were run through and within a quarter of an hour it was proved that this man was the " wanted " man.

Directly a prisoner is convicted his fingerprints are taken. An ordinary-looking ink paid is used, the prisoner,

by pressing his fingers on to it and then on a special paper form, leaves his fingerprints clearly.

These prints, together with a photograph and description of the man are filed away with thousands of others at the Yard.

Checking fingerprints with those in the bureau is a skilled business. The collections are classified by means of numbers given after an examination of the prints with a magnifying glass.

It is plain, therefore, that if the prisoner has been caught before, his fingerprints are at Scotland Yard together with his photograph and full description, then as most of the haunts of criminals are well-known to the police, it is generally an easy matter to collect the " wanted " man.

S. Reynolds.

TALKING FILMS.

Talking films, or as they are more commonly called, "talkies" have become very popular in this country, as can be seen by the number of picture-houses who are equipping themselves with talkie apparatus; America, the home of sound films, is making big improvements in talkies; they have even used them to record and to photograph the confessions of criminals.

However, let us consider the process by which talkies are made. Firstly we will review the British system, which is very different to the American method. In the British system the sound record is photographed on to a film, which is synchronized with the film running through the camera. The recording apparatus consists of an electric lamp generating a powerful ultra-violet light, which is focussed on to a mirror; the mirror vibrates in sympathy with the fluctuations of the microphone diaphragm, the beam of light from the mirror is recorded on the moving film as a wavy line. When both films are developed they are printed on one film, the sound record running on one side of film, several inches behind the actual picture it goes with, because the sound reproducer cannot be level with the projector, owing to mechanism already there. The important factor in the sound reproducer is the photo electric cell (described in the last issue in the article on "Television"), it acts in the opposite way to the recorder, the wavy lines causing the light which falls on the cell to waver and alter the resistance of the cell, which controls the current flowing to the amplifiers. The American system consists of huge gramophone records which are synchronized with the film, that is the reason why it is possible to make some scenes in silent films, into sound scenes; such as people cheering, and car racing.

Frederic W. Walkling.

EUREKA.

The Authentic Version.

Hiero, king of Syracuse, instructed Archimedes to test the genuineness of his crown. The idea of determining its specific gravity is said to have occurred to him while taking a bath and the novelty of the idea caused him to dash through the streets shouting " Eureka," (I have found it.) Who knows whether the following is not the correct version?

In the year Umpteen B.C., lived Prof. Archie Medes, B.Sc., of 13, Comic Sections, Avingyou, Syracuse. One day, on account of his being a pal of Euclid, Aristotle, Pythagoras, Sanatogen, Thermogene and other members of the underworld, he was summoned before king Hiero who had just received his crown back from the dyers and cleaners after its annual spring-clean.

Hiero explained carefully that the crown was not bought at Woolworth's, but had been delivered in a plain van at the palace for £1 down and 15/- per month, but all the same he was suspicious that someone had been exchanging the gold crown for a cheap gilt affair. The professor was accordingly to discover immediately—if not sooner—whether it was A.1. at Lloyd's or merely a mass-production article. Although of Scotch descent he paid the professor's taxi-fare and sent him home to test it.

Now Mrs. Archie Medes had insisted that if the professor wanted to monkey about with experiments he must take them to the bathroom. Furthermore, dinner was nearly ready and he must go and have a bath if ever she was going to speak to him again! So there!

The professor meekly hung the crown on a convenient nail, filled the bath and disrobed pondering deeply, unaware that Archie Medes, junior, had been blowing bubbles and left the soap conveniently on the floor.

Wrapt only in thought and a bath towel, the professor stepped neatly on the soap and plunged speedily and head

foremost into the water, spilling about 60 gallons on the inlaid linoleum.

But his brain was working furiously. Visibly his veins ebbed and flowed. His eyebrows contracted. His nostrils dilated. His ears wobbled. A scientific idea had struck him amidships.

" Eureka," he yelled, and off he dashed, seizing the crown and not stopping for his clothes. The cinema commissionaires stared, the tram-drivers pulled up abruptly for him, the policeman at the palace gates did not even question him.

" Eureka ! your majesty, eureka ! go and have a bath wearing this crown. Have another to-moorow wearing a real genuine one. If the queen kicks up a row about there being more mess than ever in the bathroom you will know this crown is a fake."

O.K.B.

PILOTLESS PLANES.

Pilotless planes have already made long flights. Country after country is experimenting with the idea of being the first to launch an air attack by means of these pilotless planes.

In appearance they are just like ordinary planes, except that they are smaller.

The real pilot of these planes is a wireless receiving set and control board. An elaborate code is used, which, on being received by the set on the plane, acts on the elevators, ailerons, rudder and engine controls through the auxiliary mechanisms.

Certain vibrations of the ether operate the elevator, others would work the rudder, and yet more would control the engine.

By moving a lever on the control board on the ground a lever would be moved on the aircraft, and it is manœvred with ease from the ground.

In later models the code has been extended so that the operator knows the speed, height, course, and angle of the plane.

Some carry a televisor which shows the ground over the course which the plane has taken.

R. Bodiam.

THE MEMORIAL PHOTOGRAPH.

The Memorial Photograph of Mr. McCabe was unveiled on Thursday morning, 26th March, in the large schoolroom. The photograph is an excellent piece of work, mounted in an oak frame, and is a first-rate portrait of Mr. McCabe as he was some 15 or 20 years ago—in the prime of his life.

After singing the hymn, " Through the night of doubt and sorrow," which was one of Mr. McCabe's favourite hymns, Mr. Piper said that the unveiling ceremony was a pleasant one inasmuch as we should now have a permanent visible memorial of Mr. McCabe, but an unpleasant one inasmuch as he was no longer with us. The day was the 75th anniversary of Mr. McCabe's birthday, and seemed a very appropriate occasion to ask a very old friend of the School, the Rev. C. W. Martyn, to come and unveil it for us. It was sometimes quoted that " the evil that men do lives after them," but Shakespeare was putting this into the mouth of a selfish character who wished to injure the memory of his friend. It was the opposite with Mr. McCabe, and it could be truly said that " the good he did lives after him." Mr. McCabe's good standing and name was founded upon his upright character. He was always just, fair, and spoke the best he could without flattering. Mr. Piper hoped that the photograph would remind them all of Mr. McCabe's wonderful influence, and that his memory would help to keep the School a good influence in the town.

The Rev. Martyn, Vicar of St. Peter's, said that he had known Mr. McCabe for 15 years, and had spent many very happy hours in his company. He had assisted at many functions in the School, and he had great pleasure in unveiling this excellent portrait of his old friend.

The boys stood reverently at attention while the cover was removed, and then the Rev. Martyn added that the best memorial and the one dearest to Mr. McCabe was the School itself. It resembled the plate in St. Paul's Cathedral to the memory of Wren, its architect, which read, " If you seek his monument look around you." The boys themselves were Mr. McCabe's monument, and they had been going out into the world carrying with them the impress and influence of their teacher. The School was well known in Maidstone, and had attained its position by the efforts and good work of Mr. McCabe, whom he had known as a good Christian and a genial and good-hearted gentleman. He wished the School every continued success, and he felt sure the good work done by Mr. McCabe would go on.

Mr. Wallace proposed a vote of thanks to the Rev. Martyn for sparing an hour or two of his valuable time, and he was certain that it was a day that everyone present would remember for many years—perhaps all their lives.

The vote of thanks was carried by W. Beale, the School Captain, calling for cheers for the Rev. Martyn, which were heartily given, and the ceremony then terminated.

Correspondence relative to this magazine should be addressed to the McCabe Commercial School, London Road, Maidstone. All Old Boys of the School are urged to become regular subscribers and thereby keep in touch with the School and one another. The subscription is 2s. 6d. per annum for three issues.

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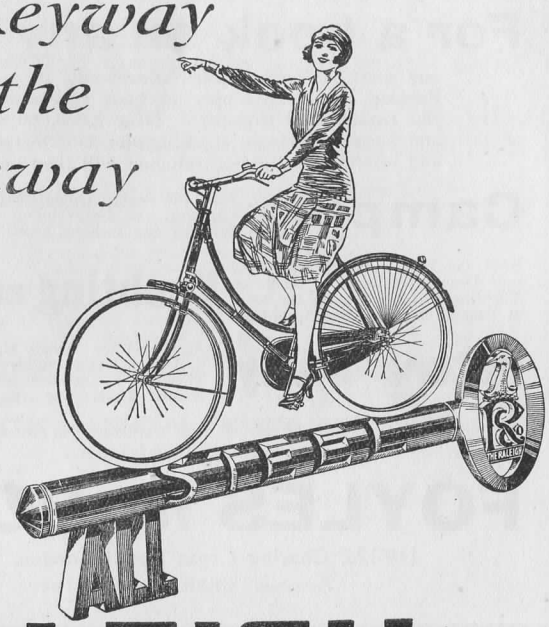

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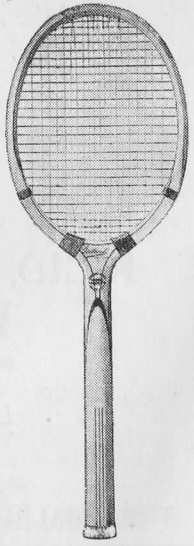

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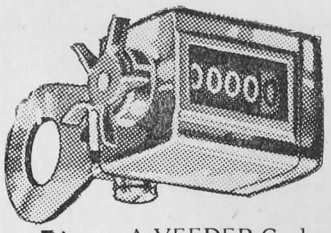

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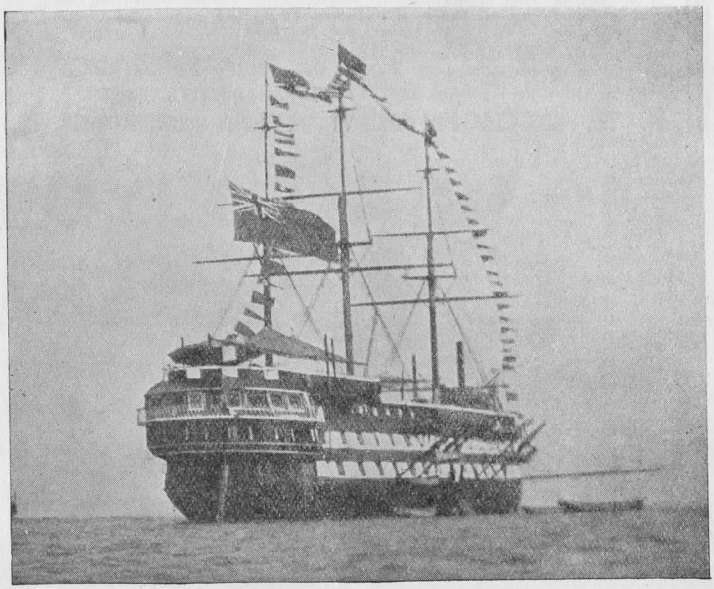

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