



HIS HOLINESS POPE BENEDICT XV.

❖ THE ❖ CATHOLIC INSTITUTEMAGAZINE.

Vol. 7.

SPRING, 1915.

No. 2.

Published three times a year. Subscription 1/- per Annum.
 Address all communications to the Editor of the Magazine, Catholic Institute, Liverpool.
 EDITOR, F. T. MEEHAN. SUB-EDITOR, J. FLANAGAN.
 HON. SECRETARY, D. B. PARSONS.

CONTENTS.

Editorial	1	Attila	13
School Notes... ..	2	Cage Birds	15
Submarines and Torpedoes... ..	4	C.I.O.B. Association: Executive Meeting; Death of Very Rev. Dean Cahill and Mr. C. P. Murray; etc.	16
Homeward Bound	7	The Building of a Big Ship... ..	22
Glass and Glasses	9	Athletics: Football	24
Modern Margarine Manufacture	11		
The Evolution of a "Match"	12		

❖ EDITORIAL. ❖

With tedious and leaden GLORIOUS tread the most baneful of SPRING. winters has hobbled sullenly by on its journey to the mighty past. But we still perceive its lingering shadows casting a sickly gloom over the fair face of the much wished-for Spring. Nevertheless we feel that during those dreary days of darkness concentrated malice has wrought its worst; and notwithstanding the solemn climax of "Der Tag" we now stand on the threshold of an historic Spring, confident that in the near future we shall behold a glorious sun-burst rise over the devastation of the battlefields, proclaiming the might of right and justice, and the sacredness of liberty.

Life still ebbs away and POETRY. we are weary waiting for the auspicious moment when the Muse will inspire the latent talents of our dormant bards to bestow on our prose-afflicted readers the charms of their poetic imaginings. Perhaps it is inappropriate to expect even the favour of a jingling rhyme in these degenerate times of sordid slaughter; but with the raw material for a score of epics strewn across the face of Europe, and with a daily quota of valorous deeds unsurpassed in history, we must needs conclude

that the return of nature's minstrelsy will bring to us—not hymns of hate—but the truly poetic utterances of our faith in all that is truly great and really glorious.

The Fates have irrevocably decreed that *we* shall TRY AGAIN. not have the privilege of recording the capture of that elusive Shield. Coupled with the recollection of our latest failure in this tourney comes the cheering thought that there is, or should be, a tide even in the affairs of Shields. Now it has been clearly demonstrated that the continuity of this annual function is independent even of the mighty cataclysm of the mightiest world-war; and moreover, we are convinced that our record recently established must assuredly be for us a minimum; therefore, on strictly mathematical principles, we conclude that to this minimum must immediately succeed a phase of higher hope and of greater achievement. Therefore we exhort our footballers to cheer up, because while we unreservedly renounce all and every intention of donning the mantle of a prophet we assure them that the time must needs be near when no prodigies issuing from the depths of the unknown can cause them to administer such another draught of chilling disappointment to their long-suffering supporters.

School Notes.

University Scholarship.

We have great pleasure in recording the success of Austin J. Maguire who has recently been awarded the Boyd Engineering Scholarship for which he competed last July. This Scholarship is value for £120 and is tenable for three years at the Engineering school of the University of Liverpool.

Annual Retreat.

This year's Retreat took place on February 16th and succeeding days, and was conducted by the Rev. Father Jeanrenaud, who gave us such a successful Retreat last year. We are convinced that on this occasion his earnest efforts met with even greater success. The different exercises of the Retreat were well and punctually attended, and the very practical instructions given by Fr. Jeanrenaud were listened to with rapt attention. The Retreat concluded with Benediction on Thursday morning, after which we were given a holiday, so that we might talk off the accumulated wisdom which the silence of the Retreat days forbade us to dispense to our companions.

Cercle Francais.

Les débats français se sont commencés cette année avec beaucoup d'enthousiasme. Sans doute les différents élèves qui ont parlé jusqu'à ce moment ont montré et de l'énergie et de l'enthousiasme. Ils ont fait beaucoup de progrès et leur manière de parler va de mieux en mieux. La guerre a fourni des sujets qui sont à la même fois agréables et intéressants. Le sujet du premier débat était "Que les Allemands ont accompli leur but original." Pour ce sujet ont parlé Delaney et Denny et ils ont avancé beaucoup d'idées et d'excuses de sorte que Von Tirpitz lui-même, en les entendant, aurait dû croire qu'ils étaient de haut parage allemand, tellement la matière était à la guise "Wolff." D'autre part Kennedy et O'Neill ont répondu d'une force et d'une vigueur tout inattendues. A chaque idée des "Allemands" ces deux "alliés" ont répondu d'une telle manière que les assistants ont décidé contre le sujet par une douzaine de mains levées. En considérant "Si un espion peut jamais être

honorable." Flynn et Holland ont avancé des discours d'une habileté très agréable à voir. Malgré ce fait ils n'ont pas pu gagner les esprits de ses camarades et Travis et son assistant ont indiqué l'opinion de l'auditoire.

Un trait agréable de la discussion, "Si les aréoplanes valent mieux que les sous-marins en temps de guerre," était les détails techniques et bien pensées avancées par les deux proposeurs Lawler et O'Callaghan. Au contraire Lovett et Smith ont répondu avec une connaissance de ces détails qui a montré qu'ils s'étaient très bien informés à ce sujet. On les aurait crus tous ces quatre ingénieurs où officiers marins de la première classe. Les sous-marins ont gagné le jour mais d'une majorité très petite.

L'auditoire après avoir entendu les idées de Ardern et de Parsons au sujet de "Si les Allemands pourraient empêcher qu'on apportât des provisions en Angleterre," ont cru que cela était impossible.

Tous ces deux ont montré un grand avancement dans la manière de parler qui indique le bien qui se produit en ayant soin de noter en détail les fautes d'autrui et de les corriger. Barnwell et Flanagan les ont suivis d'une manière aussi habile et la discussion s'est prolongée avec une intérêt et une clarté bien à désirer.

Ces débats montrent la vérité du vieil on-dit;—A force de forger on devient forgeron.

A Mock Trial.

In former sessions the concluding day of the winter term was signalized by an impromptu concert; this year, however, we departed from the traditional custom and as a result enjoyed a "mock trial." About eleven o'clock there was a rapid movement from the "Colony" towards the "Lecture Room," where we had the pleasure of seeing the accused put into the dock. When Attorney-General Denny had stated the charge and delivered his address we were aware of the fact that Franz Von Neill, the accused, in the course of systematic espionage for an alien power had not hesitated to sink one of our most formidable battle-ships with almost all her crew. One of the few survivors—a member of the "black squad"—appeared swathed in bandages and told his tale in simple, honest language. His evidence bore striking testimony as to the savage behaviour of

the accused. This seemed to seal the fate of the adventurer, although under what code or jurisdiction the case was tried it is hard to say. In spite of the brilliant speeches of Counsellors Flanagan and Meehan, and the strange nature of the evidence produced; despite even the frantic appeal from the dock; after a long and interesting trial, His Honour the Judge announced that the accused must receive condign punishment, and we departed conscious of having done our duty.

Debating Society.

Work in connection with the above was not commenced until a later date than usual in the New Year, and consequently our first debate, "That Japanese troops ought to be invited to take part in the present war," was not held until February 1st. The leaders F. O'Neill and J. Flanagan, delivered speeches of great length, and when the latter, who led the opposition had finished one wondered if any of the succeeding speakers could manage to produce anything resembling a new argument. Two speakers only—T. Smith and P. Hart—rose for a very short time above the level of painful reiterations. The voting resulted in favour of the side led by F. O'Neill.

On February 22nd we held our second debate which was that "Hitherto sufficient importance has not been attached to the study of foreign languages in our schools." The motion was proposed in a concise and logical manner by W. Delaney. He was opposed by P. Peters, whose remarks were entirely directed against the effects on the vocal organs of a study of the German language. This speech served to set up a train of orations on the uses and the evils of studying German. Of those who took part in this tourney F. Kirby and P. Denny were the most coherent. The motion was carried by a handsome majority.

"That no European Peace Settlement which does not adequately respect national sentiments will prove satisfactory" was the subject which was discussed on March 2nd. The motion was proposed by F. O'Neill who held that all nations involved in this war should, with the exception of Turkey, have their national aspirations respected. P. Peters, H. Lovett, and T. Smith, who followed on the same side, tried to

make the most of the results of the Congress of Vienna. For the opposition F. Kirby and J. Flanagan were prominent. The latter took some trouble endeavouring to prove the total absence of any such thing as national sentiment. P. O'Callaghan and E. Travis concluded the arguments for the Opposition who had the satisfaction of proving the victors.

In the "Upper House" the first subject debated, on Jan. 4th, was, "That the attitude of U. S. A. in the present crisis is detrimental to the best interests of civilization." J. Donnell, who initiated the discussion, J. Aindow, M. Byrne, and R. Cunningham pleaded for American intervention in the present war. Their chief argument was that America by her intervention could shorten the war considerably, and thus promote the interests of civilization. The principal view expressed by the opposing speakers—J. Byrne (leader), T. Birchall, T. Ardern, and J. Cole—was that there were already enough nations engaged in the titanic struggle, and that more men, money, and material ought not to be expended through American intervention. The voting favoured the side of J. O'Donnell.

At the next meeting, on Thursday, Feb. 11th, the subject, "That the simplification of English spelling is desirable," was debated. C. Irvine, P. Kearney, and P. Magee speaking in favour of the simplification urged that, as a result of adopting a reformed system of spelling, trade with foreign countries would be facilitated, and that foreigners would find the English language easier to learn. The opposition—T. Honan, F. Doyle, and T. Fleming—held that any such change would involve great industrial and commercial confusion, and would, in fact, be a colossal piece of literary vandalism, and they had the satisfaction of seeing their views endorsed when the vote was taken.

The next meeting was held on Thursday, February 25th, when the subject, "That the Discontinuance of Sports during the War is desirable," was discussed. S. Kennan, J. Phelan, A. Anderson, and R. Toole pleaded in favour of renouncing, for the moment, every form of sport and pastime in order that all available energy may be utilized for the "greater game." The opposition speakers—T. Ardern, P. Gaughan, J. Aindow, and D. Parnell—had an uphill

fight, and were ultimately defeated by a sweeping majority.

On March 9th, a debate was held in which it was maintained that "In the interests of the future peace and well-being of the world, that portion of the Turkish Empire situated in Europe should be placed under Belgian Protection after the war." The motion was proposed by J. Walsh, who was supported by D. Doyle, J. Murphy, and D. Parsons. The trend of their argument was that the only recompense which could be made to suffering Belgium would be a territorial one, and that the Ottoman Empire was a country which would serve that purpose. For the opposition P. Denny—who led—F. Meehan, J. Kennedy and T. Holland all deprecated any such action as was meditated in the motion, but to no purpose, however, as the motion was carried by an overwhelming majority.

Pro Patria Mori.

We deeply sympathize with Mr. and Mrs. Lynch on the loss they have sustained by the death of their eldest son. He served in the King's Liverpool Regiment, and was so seriously wounded at Ypres that he succumbed a few days later at the hospital in Rouen. May he rest in peace.

Submarines and Torpedoes.

[By J. F. O'NEILL.]

The Submarine has always proved a topic brimful of interest, but the advent of "Der Tag," when by means of these vessels the Germans threatened to blockade the coasts of the British Isles, has given us a special interest in them. Hitherto, Submarines were an undeveloped arm of various fleets about which little was known, but the activities of these "devil-ships"—as they are aptly styled—in the present war, have centred on them the attention of all.

They are universally regarded as being a modern invention, although such men as Drebbel and Bushnell in the 17th and 18th centuries respectively, and Fulton in 1801, foresaw the possibility of constructing a submersible craft. They met with some success as regards the sinking operations, but, once submerged, their vessels were out of communication with the outer world, and were moreover totally unable to propel themselves in

any direction. Two inventions—the periscope and the internal combustion engine—served to remedy these grave defects, and in 1898 the "Holland"—so called from the inventor, Mr. J. P. Holland, who was born at Limerick, Ireland—was built in America, and was furnished with these two most valuable appliances. This first submarine had a submerged displacement of about 70 tons and a length of about 50 feet. It had a surface speed of six knots, and when submerged could travel five knots an hour. Her complement, moreover, was but a dozen men, and she had but a single torpedo tube. Once started in this direction men's minds soon conceived improved models, and a few years later the "Improved Holland" type was produced. In this model the periscope had been brought nearer perfection. It now consisted of a thin tube of about six inches diameter, and twenty feet in length, inside which was an arrangement of lenses and mirrors by means of which an image of any portion of the horizon or of an external object is reflected down the tube and into the object-glass of a telescope. This tube can be rotated at will as well as raised or lowered, and thus the once blind submarine can now see, generally without being seen. The more up-to-date craft are fitted with two periscope tubes, and thus the watch is doubly vigilant.

The next production was the "Perfected Holland" of 520 tons, length 150 feet, with a speed of 14.5 knots at the surface and 10.5 knots when submerged. It was capable of steaming 120 miles when under the water, and 4,500 upon the surface. It was moreover provided with four torpedo tubes. The most notable change in this vessel was, however, the introduction of the Diesel or heavy-oil engine. Previously these craft had been propelled by means of the petrol engine. The inconvenience attached to this engine, however, was that since petrol is a very volatile substance there was a continual danger of explosions occurring.

Fortunately, with the introduction of the Diesel engine this menace was removed. The first heavy-oil engine to be used in a submarine was one of 500 H.P., but the model has now been perfected to about 2,000 H.P., and one capable of developing 2,500 H.P. is under consideration. These Diesel engines are used when the boat is travelling on the surface, but when submerged she is

driven by electricity, which is obtained from the accumulators, which are charged by the main engines when the boat is on the surface. These accumulators are also used to illuminate the interior of the ship, for the air has to be maintained as pure as possible. When the atmosphere is becoming vitiated the poisonous carbon dioxide is usually removed by means of sodium peroxide or by caustic potash or soda, and the oxygen restored to the air from cylinders of compressed air or oxygen. These precautions are very essential for the crew of a modern submarine numbers no less than thirty men of whom three are officers.

This is the case with the "E" class of our navy—the most effective class we possess as yet. These vessels are of 950 tons total displacement, 212 feet in length, and a beam of 21 feet. They are provided with six to eight torpedo tubes, and can steam 17 knots an hour for a radius of 5,000 nautical miles, whilst even when submerged they can travel at 11 knots an hour for about 12 hours. The "F" class, which will shortly be on service, will be of 1,200 tons, and have a surface speed of 20 knots. As regards the structure of these craft, their dimensions do not permit of luxury, but rather of practicability sometimes even at the expense of comfort. They are all of the same general shape—similar to a huge cigar—the pointed ends enabling them to experience less resistance when travelling. In the middle of the cramped deck is the conning tower, from which the ship is navigated when on the surface. In front of this are the periscopes and the wireless apparatus—with which most submarines are now furnished. On the deck is very often one—or perhaps more if the vessel is a large one—of those quick-firing guns, specially fitted, so that when the ship is going to dive these quick-firers can be stowed away in a hatch, which is hermetically sealed, and the hatchway made flush with the deck. When the commander wishes to dive he has the guns removed, the wireless dismantled, and the periscope raised to its highest. The conning tower is then sealed and the ballast tanks let fill with water, when the ship is "trim," as they say. It is often thought that the submarine sinks on account of the ballast tanks filling with water. This is an error, as this work only "trims" the ship. She dives by the action of the

horizontal rudders, which also regulate the depth at which the vessel will travel when submerged. The ship has to be travelling at a good speed, therefore, before she will dive, since the horizontal rudders are then tilted upwards, and as a result the vessel continues to dive until the rudders are once more set horizontal. Immediately beneath the conning tower is the navigating chamber, and aft of this is to be found the engine-room in which are the air compressors—which expel the torpedoes—the accumulators and oil engines. Here also are the men's quarters. Forward of the navigating-chamber is the torpedo room, in which are the officers' quarters and the mechanism which sends out the torpedoes. When on a voyage the food is all cooked by electricity, and *en passant* it may be said that the "E" type can carry provisions for thirty days.

The latest German submarines are run on two 2,000-H.P. improved Diesel engines, and are 900 tons total displacement; can develop twenty knots on the surface and ten when submerged; their overall length is 214 feet. If a comparison is made between these modern types and the early "Holland," we gain some idea of the progress which may be wrought in the near future. Of course as the size of the submarine increases it becomes an easy prey to "destroyers," since it takes longer to submerge. However, the more modern ones, as has already been stated, are armed with quick-firers in addition to the torpedo tubes, and this in some way compensates for the other disadvantages. Also, as the size increases the surface speed increases, and thus the difference in speed between the battleship and the submarine is gradually diminishing, and this constitutes still another advantage for the smaller vessel. Experiments which are being carried out with regard to the disposition of the horizontal or diving rudders may facilitate the submersion of a submarine. Another invention by which a flotilla of from twenty to thirty submarines may make a concerted attack whilst but one has its periscope exposed threatens to make these underwater craft still more terrifying. This is the Fessenden oscillator which is a mode of submarine signalling, by which the Morse Code can be transmitted over thirty miles and telephonic communication carried on for above half-a-mile. By the aid of this invention all that the look-out on a

threatened battleship would see, would be the periscope—and only eighteen inches of that—of a single submarine.

The offensive weapon of the submarine—the object which makes it so dreaded—is the torpedo, which even yet holds the premier place over the lately added quick-firers, either as a means of attack or defence. The main type of torpedo used is an improvement of the "Whitehead" pattern. The modern torpedo is itself a miniature submarine: it is about 20 feet long and 21 inches in diameter and is of the "cigar-shaped" form. In the nose of the torpedo is a small rod which on striking any object is forced back into a charge of fulminate of mercury, which serves to detonate a charge of three hundred pounds of damp gun-cotton. In order to safeguard the firers of the torpedo the rod has a safety pin put into it, and until this pin is removed the charge cannot be exploded. This pin has for its head two large fins which, when the torpedo is speeding to its destination, are spun round by the action of the water, and thus the head unscrews, the pin falls out and the rod is free. The chamber in which is the charge is known as the "war-head," and is the seat of all the trouble. Next to this is the air-chamber in which is stored the compressed air, by means of which the engine is driven. This air is at a pressure of 1350 lbs. per square inch when the shell is fired, but the air chamber can withstand a pressure of 1,700 lbs. The next compartment is the balance chamber which regulates the depth at which the torpedo will travel. Adjoining this is the engine—usually a Curtis's turbine—developing no less than 110 H.P., being driven by compressed air. Astern of the engine is the gyroscope, which is a rotating wheel, which automatically controls the torpedo's course. The projectile is propelled forward by means of two propellers, which run on the same shaft, but in opposite directions; this device adds to the torpedo's stability, a very necessary thing inasmuch as the torpedo, having no keel, would otherwise rotate.

There are two sets of rudders on a torpedo, a vertical set and a horizontal set; the former serves to steer the engine of destruction, and the latter are used—as in the submarine—to regulate the depth at which it travels, and thus prevent it from sinking, and both missing the target and being a loss of several hundred

pounds. However, so perfect are modern torpedoes that they have been known to be but a yard out from a range 4,000 yards. They are sent out from the submarine by a charge of compressed air, at a depth of 12 feet, and by a valve which is set before the torpedo is fired. The flow of air from the air-chamber to the engine is so regulated that it will just last the journey, and, moreover, it is so arranged that the propellers will not begin to revolve until the torpedo is in clear of the ship. Accordingly, the speed with which a torpedo travels varies as the range. For 1,000 yards it travels at 42 knots, but only 28 knots for 4,000. One of these projectiles can tear a hole of twenty square yards on the side of one of our ironclads from a range of 2,000 yards. Such a blow would in a naval engagement inevitably prove fatal, and in the case of a first time success, two million pounds sterling in the way of mechanism and machinery would be sunk by a weapon costing anything from £600 to £1,200. A shot, weighing half-a-ton, would demolish a floating fort of 25,000 tons.

Nearly all modern torpedoes are fired from beneath the surface as it has been found that the aim is truer than when fired through the air into the water. Should the torpedo miss its object, when its engine stops, an automatic valve opens and it sinks harmlessly to the bottom of the sea. Torpedoes perfected, as are the modern ones, render the submarine a much dreaded antagonist. As to what the future will decide, in the struggle between the submarine and the battleship, it would be difficult to say, and at present we must confess that it is a moot point as to which of these engines of destruction will hold supreme sway in future naval warfare.

•• LINES ••

(Written during an all-night bivouac aboard a refugee steamer in Dieppe harbour, Sept. 1914.)

Out of the cool Swiss ways between the hills
They called us as a pupa summer-bid
Break wing bewildered into burning day;
So we were clariomed in France with tune
Of trumpet, piping of young children's cries
And welcome of men's organ-notes of war
In Lyons where the silver-shining rails,
Lit by the sun, flew spearshafts infinite
That earth herself seemed hurling at the foe
At sight of this new Lucifer that set
His flaming hoof on virgin Belgium's breast:
Brave Belgium that forever now must live,
The sainted maid of nations she who heard
The voices of all virtue left on earth
Call to her through the tempest of the guns.

So, bivouacked in drifts upon the deck,
 All silence wraps us underneath the moon
 That ever and anon in sudden cloud
 Seems communing with secret straying stars.
 What grievous tales must trouble then the
 night,

Of bloody banquets spread about the plains
 And hearts of men, fair lovers, tender sons
 And fathers fainting for the breath of home!
 Oh, hearts now purple for the sucking fly
 The leech and woeful crawling things of earth!

But in that Palace over by Berlin
 A worm has entered, breed of all decay,
 Low creeping pride of intellect that eats
 The heart of kings that lesser men may live.

D. L. KELLEHER.

Homeward Bound.

[BY P. W. DENNY.]

The greatest pleasure of men who have reached that period of their existence when their wisdom is inversely proportional to their age, and who are in fact in that state of senility known as second childhood, is to express their thoughts in a stream of words more remarkable for its continuity than for its sense. Certain boys in—I won't say their first childhood, but in their first period of continued childhood—are prone to the same evil. This especially applies to four youths whose routes to and from school coincide with mine, and consequently it is my fortune—whether good or ill I know not,—to share the companionship of this quartette, except indeed when abnormal circumstances intervene.

The evil of rapid and protracted conversation is generally believed to be confined to canvassers, auctioneers, and politicians. However, the trait is, to some extent, necessary to these so that they may, because of their importunity, dispose of their stock-in-trade to their harassed victims. But when a boy, in all other respects sane, exhibits the same symptoms, the case calls for immediate treatment. What this treatment may be is an unsolved problem of psychology. Later on it may happen that a humanitarian government will appoint a special committee of mental experts to advise the Board of Education on the subject. The urgency of the matter has been forcibly brought home to me since I have been admitted to the companionship of these four youths I have already referred to. It would be difficult to imagine in sane society more violent clashes of ideas and ideals than

oftentimes occur in their wordy conversations; a brief and altogether inadequate character sketch of each will perhaps convey best to the reader the nature of the situation.

A. Crossbar is the least tolerable of these four boys. His sole object in life seems to be that of existing in a state of oblivion to all phenomena save those connected with sport. He is not himself by any means an athlete, nor is he ever likely to become one, but he is a perfect encyclopædia of records in every branch of sport.

Though we are not sure whether he could distinguish a whippet from a poodle, he can quote a long list of favourites in recent years at "Altcar." It is probable his eyes have never been gladdened by the sight of a "Grand National" winner, and yet he is painfully familiar with a surprising amount of *turf* lore. His sympathies extend rather languidly to the national summer pastime, nevertheless he has a profuse vocabulary of "yorkers" and "brakes," and can proclaim the virtues of a straight bat with an eloquence worthy of Jossop or Jack Sharp. But it is in "Soccer" that he loves to specialize. Indeed, if he could put into practice his theories on the various forms of athletic activity, he would be all round champion of the world. Strange to say his ideas never materialize, and no one recognises his tremendous ability. Once, whether by accident or design, I know not, Crossbar was selected to play for the school team as left-half. At the commencement of the game he happened to obtain possession of the ball and took the initiative on the left flank. Enemy forces arriving in the shape of the opposing wing forward, our hero was driven back on the entire front. However, this did not deter him from usurping the position of captain and shouting directions to the other members of the team. Needless to say, his commands to "break their centre," "draw in the left wing," and "to advance a salient in front of the penalty area," were *not* obeyed. When a vigorous struggle was proceeding before the enemy's goal, he obtained the ball while the opposing goalkeeper was outside. He did not shoot, for as he afterwards explained, he was not quite in a position to commence regular siege operations before the goal. It is not recorded that he was given another opportunity to prove the truth of his

theories, and so he seems destined to remain a simmering stew of athletic theories and records: later on he may indeed join the band of ardent worshippers at the shrine of the "bookie."

Another member of our company is Septimus Crank, who is a young person of peculiar talents. He knows every principle of chemistry and physics except those contained in the lesson he has to learn for the day. His power of mental concentration is amazing. During the geography lesson he reflects with the full force of his massive brain on the effect of Hertzian waves on explosives, and when his class mates are engaged in learning Latin he is trying to design a gyroplane.

His projected inventions are great in number and marvellous in effect. His idea to utilize the energy of water coming from a tap is weird, to say the least. The falling water causes a light wheel to revolve by striking the flanges in rapid succession. Thus a current is induced in a manner similar to what occurs in the Power House at the Niagara Falls. Having constructed the apparatus, after mutilating his hands by accidentally striking his thumb with the hammer, and then bathing it in sulphuric acid by mistake, he was eager to see the result.

The machine was placed under a stream of tap-water for several hours. However, the result was not what the inventor expected. He had the mortification of seeing the machine chopped up by an irate parent who expected a heavy fine for undue waste of water. This is but one instance of his misapplied genius. At another time he conceived an unique idea for changing the colour of fur by the injection into the animal of a liquid of his own invention. In order to have plenty of subjects to experiment on he interned all the cats of his neighbourhood in a type of concentration yard. It seems incredible, but it is nevertheless true, that the owners of the animals were angry instead of delighted at the prospect of helping science. One interfering old lady who had been deprived of a prize Persian even went to the extent of prosecuting our hero.

It seems as yet impossible to predict the future lot of this person. He may, but the probability is small, become another Edison. Perhaps he will be content to live in poverty, squandering any money he may possess on hair-

brained schemes. Most probably he will live nursing his eccentricities as far as circumstances will permit.

Phil Ately is the third of my quartette of home-going companions. He collects foreign stamps of every kind and is quite an authority on stamp-lore. His scanty pocket-money is spent procuring rare varieties. Much time which might be spent in the pursuit of useful knowledge he spends in trying to secure "sur-charged Borneos" or "unused Ceylons." He follows a mythical "Blue Mauritius" as Lancelot followed the Holy Grail. In the pursuit of rare varieties he is as skilful as Nick Bloke in tracking a criminal to his lair.

In arranging "swaps" and bargains he is as skilful as a youthful Lloyd George, but when his lessons are examined he scores an unprecedented succession of B's.

His opinion of everything is controlled by philatelic considerations. He is averse to Russia's occupying Vienna lest there should be no more Austrian stamps. Again, the fact that the Allies support small nations and that these often issue unreliable stamps gives him much food for sad reflection during the present crisis. He seems possessed of good parts, but like Will Wimble he is fated to waste them on trifles.

The fourth member of the group, Launcelot Cuthbert Gordon, is the son of a wealthy coal merchant. As he is the only child in the family, his parents regard him as a being whose sole object is to devour sweets and appear like a picture out of a fashion's book. He is always well supplied with pocket-money and scent. Although all ordinary persons only trouble about how they can obtain the money which they spend, his only worry is how to spend the money he has got.

In School, he is generally engaged in masticating the latest kind of sweetmeat. His favourite variety is the scented cachou sold in small penny packets. He also shows a marked preference for expensive chewing gums. It is related of him that, having explained to a Form II boy the method of solving a problem in Arithmetic, he was offered by the youngster, in a burst of generosity, a piece of 4 oz. a penny "stick-jaw." To the surprise of the grateful one, the gift was not accepted, for Launcelot is too much of a gourmet to eat anything cheaper than 6d. per quarter. From

that day, Form II has unanimously held the belief that an "Old Boy" at Rainhill is quite within the bounds of possibility.

Personally, I feel more concern for the future of this youth than for any of the others. He appeals to me more forcibly as the victim of circumstances, and as we pass the different apothecaries shops with their sinister displays of gastric and other tonics and catch a glimpse of the flaring signs of different Dental Institutions, I feel instinctively an inward pang for the future of our pampered companion.

It is singularly unfortunate for me that these four individuals whose characters and views differ so greatly are prone to promulgating their opinions as we plod wearily homeward each afternoon. Since no one of the four is interested in the others' hobbies or conversation, they all address their remarks to me. My head is, therefore, constantly in a whirl, having to listen at almost the same instant to observations about the "blue Mauritius," the trajectory of a golf ball, Ridley's Rosemint gum, and secondary alcohols. I have, then, discovered a problem which is devoid neither of interest nor of difficulty, and I feel that when it is placed before readers of the *C.I.M.* I shall have taken a very decisive step towards its solution.

Glass and Glasses.

By J. J. BROWN.

A study of the common-place is almost always apt to be uninteresting; whilst learning about things that are rare and curious is extremely fascinating. The latter pursuit rouses the exploring instinct in us; we experience the same thrill of pleasure as the hardy pioneer traversing a country which promises to be a great field of enterprise for the human race, especially of course for the particular nation to which the explorer belongs. We study these rare articles and, studying them, we feel this keen pleasure without having to endure the hardships of the pioneer. Then when we go amongst our fellow-creatures a benevolent spirit animates us and we feel inclined to be a little patronising to the generality of people. When, therefore, we impart our knowledge to others we do so mentally patting them on the head and letting them see the wheels go round in our watch. I dislike

enlarging my knowledge of any common article, because the inclination always comes to me, when the article in question is encountered, to say: "I know your constituents, I know the manner in which they were combined, shaped, and fashioned. I am perfectly acquainted with you. You are the simplest and most uninteresting of the hundreds of familiar articles I encounter."

Glass is probably one of the commonest of the substances that make civilised life endurable, and now I feel no respect for it, despite the service it renders to mankind, because I know how it is made. Probably the relating of the manner in which the glass is made from unpromising ingredients would increase the mystery, if any, existing in the minds of most people about the various processes used. The only really interesting feature about glass is its origin, and, strive as they will, archaeologists professional and amateur, cannot dispel the mist surrounding the origin of this translucent substance. All their burrowing and mining in the underworld of manuscripts and papyrus has resulted in little save the supplying of material for building mounds of conjecture. At present, therefore, we are left with the legend of the Discovery of Glass by certain Phœnician traders who, being wrecked on an inhospitable and sandy shore, had perforce to cook their provisions in earthenware vessels supported by blocks of natron over a fire which, melting the sand and natron, "glazed" the pots. The whole legend is too long to be recounted here. I thought it a very likely and plausible account of the origin of the substance—until I met another legend. I read each a second time and then wished I had only discovered one of them. I determined to read them alternately for six hours at a stretch with the view of finding out which I liked least at the end of that time. I began well. At the end of two hours my eyes showed signs of revolt. I paused. The call was unmistakable. They wanted me to discourse on the service rendered them by glasses.

Well, an interesting "sideline," as it were, in glass are spectacles, those modifications or rather elaborations of the old horn rimmed, oft-times inlaid, barnacles that were made to suit all ages: large solemn ones for the aged, square ones for professors, and neat pairs, so made that they shone and sparkled as

though with the joy of living, for the young and sprightly.

What a spectacle (pardon) it would be if all persons who wore spectacles were to march in procession past an assembled company of opticians. It would be a scene worthy of description by the author of the "Pied Piper." There would be a noise as of a vasty ocean, ever restless, beating against an iron shore; and what a sight there would be of innumerable people each adorned or otherwise by the glittering lenses. The solemn, stolid middle-aged would wear stout serviceable spectacles meant to last the allotted span of human existence; then the young with the latest shapes in vogue, the very young with defiance written all over their spectacles which pass through exceedingly exciting and quickly terminated lives; the elderly person seemingly absent-minded, for a black chain or cord attaches his spectacles to his button-hole. What a variety of rims there would be: light rims, dark rims, massive rims, absent rims, gold rims, iron rims, silver rims, steel rims, all twinkling and winking!

Almost every countenance is altered, sometimes for the better but more often for the worse, by the addition of a pair of spectacles. At a lecture it seems to be a matter of common opinion that if the lecturer is aged, a pair of spectacles are a necessary adjunct to render the discourse a success. There is much harmony between a pair of spectacles and a flowing white beard in conjunction with abundant curling locks. It is a patriarch not a savant that is speaking; his words are weighty, laden with the burden of crushing truth. Let not, however, the lecturer remove the all-transforming pebbles, for then the spell that held the audience in thrall is broken; the professor has removed the magic cloak and is himself, his real self. It is then and only then that all notice how weak he is; how frail in stature; not in the least a commanding presence; how pale and wrinkled are his features. Great furrows, the marks left by the dragging feet of Time, are visible all over his wan face. His back is bowed and his thin beard points forward as if his pale sunken eyes, almost closed by long watching and overhung by shaggy white hair, are peering into the future. Why it is only the shell of a man dried up by time and shattered by strenuous study. The spirit within is pouring itself forth by means of the hastening

tongue eager to impart its secrets before it is finally compelled to leave this earth of earth. Yet no heed is taken; the mind is over-shadowed by the poor remains of a man that are in the glare striving to gather together all the poor dregs of strength to continue the struggle against the ravages of time. Why did he take off his spectacles?

In a similar manner the ludicrous effect is produced, and otherwise unnoticed persons become instantly provocative of laughter. General expressions are transformed to such a degree as to become almost unrecognisable. A hand, as it were, has passed over the face altering it entirely. A smug, inane expression settles over it; the eyes are stupidly yet gravely solemn; the eyebrows seem to rise towards the hair; and every minute the idiocy is intensified. A smile becomes a vacant grin contorting the whole of the face, the ears seem to resemble those of a monkey, either all-present or entirely absent. Grief is indescribable. Yet the face becomes normal immediately when the spectacles are removed.

The single glass, the monocle, imparts to the face a blank look that nothing can remedy. The "Cholly Knut," if I may be permitted to classify the species, is the inseparable associate of the monocle, and the latter together with a pronounced absence of chin, a large attention-attracting nose from which an almost imperceptible brow recedes is invariably included in the representation of the gilded youth. The strange fact is that Time does not seize this space on which to trace with his oft used forefinger.

Dear reader, can you try to imagine Shakespeare in a pair of barnacles, great black rings round his eyes, the pupils of the latter being magnified many times, and thick black wires crossing each temple? Yet try to picture in your mind Thackeray without his spectacles. Perhaps the author of "The Human Understanding and Association of Ideas," can explain why a person can be pictured with spectacles more easily than a person wearing them continually can be pictured without.

The reader must pardon this lengthy digression for 'tis certain that of the grey matter of my cerebrum the elements are so mixed as to render uncertain a chain of thought. Revenons à nos moutons. All around one both in the largest city and in the smallest

village, in short wherever a collection of houses is found, one sees glass. It indeed symbolises human frailty. The greatest feat man accomplishes is to avoid breaking glass at every moment. Everywhere there are great sheets of glass; glazed vehicles travel past him; he walks on glass set into the pavement; his toilet is impossible without accessories made of glass; his dining table is covered with vessels made of glass. He cannot escape it for it is omnipresent. Even when conversing with a friend, mayhap that same friend is beaming on him with a glass eye.

Modern Margarine Manufacture.

[BY MR. J. FLETCHER.]

During recent years, progress in this manufacture has been so rapid that the tendency is to forget its earlier history. In 1860, a Frenchman, Mège Mouries, experimented, by mixing melted beef-fats with animal oils and milk. He churned the mixture, afterwards rapidly cooled the product by means of ice-water, and obtained a uniform mass, which was termed 'oleo-margarine' or 'butterine.' These simple experiments have led to a business of enormous magnitude, and of ever increasing possibilities in the future.

The margarine that we now purchase in the shop may be composed of animal or vegetable fats, or of a mixture of both. The principal fats used are Oleo, Premier Jus, Stearine, Coconut Oil, and Cotton Seed Oil, although during recent years several new oils have been used, such as Arachis Nut-Oil, and Soya bean oil. The texture of the finished product depends upon the proportion of fats and oils used, and also upon the quality of the various constituents; this portion of the manufacture is necessarily a secret, possessed only by the makers. Before any materials are purchased they are first submitted to a staff of efficient chemists, who report upon their suitability. Thus the first stage in the manufacture is to obtain pure materials. "The ingredient formulæ are the outcome of experience and research at different seasons of the year, and under varying geographical conditions." Naturally, the composition

that is suitable in winter, will not be suitable during the summer months.

The fats and oils are melted in large iron melters, having a capacity of just over two hundred tons each. These melters have double jackets, and are heated by steam; and whilst the heating goes on the fats are kept in constant agitation to prevent local over-heating. When a certain temperature has been reached, the melted fats are run through a series of filters to remove any mechanical impurities, such as a stray nail, or a chip of wood from a barrel. From the filters the liquid products are led to the temper baths. These baths are similar to the melters and serve to keep the mixture at a constant temperature. If the temperature was not suitable for the addition of milk to the oils, the emulsion would be spoiled. Before the milk is used, it is pasteurised for a few minutes at 82° C, in order to remove undesirable bacteria, and is then cooled by means of a cooler. The milk then receives a "pure culture," which is the basis of a good flavoured margarine, and is then soured. From the temper baths the fats are run into churns, and are mixed with the milk, by means of revolving baffle-plates, whilst a suitable churning temperature is obtained by means of steam and water. The churning helps to form a good emulsion. After the churning the mixture is allowed to run out and is rapidly cooled by a spray of ice water, which crystallises the fats. The rapid cooling prevents the separation of the ingredients in the emulsion, and "serves to absorb minute casein granules which are as a nucleus within the fat." The product is now removed to a maturing room, where the superfluous water drains off and where the temperature is arranged, so that the bacterial flora of the milk is allowed to exercise a maturing effect upon the casein.

After maturing, the product is salt-washed, and is kneaded into a silky mass by means of rollers, or specially prepared drums. It is again placed in the maturing room, where it is drawn upon for final blending. The blending enables the manufacturer to suit the requirements of his customers, and it is here that additional salt, colouring of butter is given to the margarine.

The finished article when leaving the factory must not contain more than 16% of water nor more than 10% of butter.

As in similar factories a number of

subsidiary departments employ many hands in box-making, packing, etc., as well as a staff for the engine-room, whence the power for the machinery is derived. Until recently a large amount of prejudice prevailed which militated against the sale of margarine, but nowadays the intrinsic worth of the genuine brands of margarine as a food-stuff is better known, and the market for them is very large, and is continually increasing.



THE

Evolution of a "Match."

[BY T. SMITH.]

We see on all sides abundant examples of the contempt that springs from familiarity, and perhaps the most glaring instance occurs in the care of an ordinary match. If the domestic of the flint and tinder days were to behold her sister pushing a whole box of vestas into the fire-grate in her anxiety to hurry up the morning fire she would be justly shocked at the extravagant procedure, if not even more puzzled at the satisfactory result; and the youth of our time to whom the King, Lords, and Commons of the realm have secured the right to indulge in "fags" would suffer grave inconvenience if his sources of "lighting up" were as crude and as unsatisfactory as they were before the advent of the box of matches. In short, we find it difficult to realize how our ancestors found life worth living without most of the conveniences we have to-day, and yet we need only go back a very few years to get at a period when even matches were unknown. Only one hundred years ago it was possible to purchase fifty matches, called Congreves, for half a crown, and only a few years before Queen Victoria came to the throne the first friction matches were produced by a chemist named Walker at Stockton-on-Tees. The matches were hand-made, and no doubt the rate of production was slow. Nowadays we can purchase a dozen boxes for a penny probably because improved machinery can turn out about a thousand gross of boxes per day per machine, each box containing on an average fifty five matches. There are various types of matches in use:—the square wood match, the round wood match, and the "vesta," a round wax match. The "safety" match is also a

familiar type. We shall now see the various processes which provide us with these useful products.

The wood generally used in the manufacture of matches is aspen, which is imported from the Baltic ports of Russia. The log of aspen is first cut into lengths of 30" by means of a belt-driven circular saw. The log is then stripped of its bark and cut into strips, about one-eighteenth of an inch thick, by means of a machine called a peeler. At the same time the wood is scored ready for folding, and it is then cut into shillets (pieces suitable for the inside or cover of the box). The ends are now dipped into a pink dye to cover the edge of the wood, and then the shillets are passed on to the box-making machine. This machine folds the shillet into its proper shape, and it places it in a position just as a blue paper envelopes it.

The cover is turned out even more scientifically. The shillet is folded along the same lines as the box, and is mechanically wrapped and sanded, and so turned out complete. The last scene of all in this strange eventful history is the fitting of the cover on the box. In this "nesting" process one attendant places the covers in a down spout while another attendant places the boxes in a horizontal receiver. The machine moves along until the box is nicely fitted in the cover and is ready to receive the matches.

Now that the boxes are ready to receive the matches, let us see how the matches are made and placed in the boxes. The logs are cut into lengths as before, and then subjected to a peeling process, which peels the log into veneers. About 12 to 20 of these are then placed under a guillotine, which splits the veneers into splints, whose length and thickness are the same as those of a common match. Naturally these splints contain a great deal of shavings and imperfect sticks. To remove these shavings the splints are riddled, and thus all odds and ends are shaken out, and the good splints are sorted so that they all lie parallel to one another on the tray.

When the splints are so placed, the tray is placed in a large machine, and a series of punches push the splints out on to another perforated plate which receives and maintains them in a vertical position. Such a plate, as one would suppose, has an appearance similar to the bristled coat of a porcupine. This

plate first carries the splints through a bath of paraffin, and then tips them by allowing one of their ends to dip into the prepared composition. The plate holds them suspended until they are dry, and then an attendant removes all imperfect sticks, while the good matches are punched out on to small trays. These trays have a slight shaking motion in order to keep the matches in position. They carry the matches to the boxes ready to receive them, and these are then passed into a trough where they are arranged in packages of a dozen and wrapped up ready to be supplied to the customers.

For the manufacture of "Swan Vestas," pinelogs, free from knots, are used. These logs are placed in the machine which forces them against a number of keen-edge cutters. Each splint is made exactly the same size and shape. They are then subjected to nearly the same process as an ordinary match. The only difference is that when matches are in the boxes, girls put the covers on. The other sort of match, not so commonly used however, is the wax vestas. Instead of large logs of wood, large ropes of hemp are imported. One of these ropes consist of a number of bunches of fifty strands, each bunch being kept separated by a flannel end-piece on the rope. Two of these ropes are wound on a large drum, each being kept separated by means of the fore-mentioned end piece. The free ends are then passed through the interstices of a very small fence-like apparatus standing on the edge of a tank, then under a roller which very nearly touches the bottom of the tank, and lastly through a hundred holes in a steel disc and on to another huge drum. The tank is then filled with glue and stearine, kept liquid by means of circulating steam around the tank. The second drum is revolved, and gradually it unwinds the first drum of its hundred groups of threads, each group receiving a coating of stearine, and all superfluous stearine being taken off by the disc. This process is repeated several times, the temperature of the bath being reduced after each winding, and one rope produces about 150 miles of smooth taper on a reel. This is now taken to the match-room, where it is cut up into the required lengths, dipped and dried, and finally packed into boxes, by a machine very

similar to that used in making wood vestas. The differences in these machines are that lancets replace the steel cutters, and that a chain grips every stem as it is cut off by a tiny spring, so as not to injure the substance.

We saw that a great deal of waste wood was evolved in these processes. Formerly this waste was burnt, but since the introduction of the gas plant it is now used for fuel to produce power from the gas plant.

The study of the evolution of the composition of the head of the match is very interesting. The head of the first chemical match contained sulphur and a coating of potassium chlorate, ignited by dipping the match into sulphuric acid. The first friction match contained sulphur coating with antimony sulphide, potassium chlorate, and gum. This composition is still retained in the safety match of to-day. The land-mark in the history of chemical matches is the introduction of the use of phosphorus. These matches originally contained a mixture of potassium chlorate, phosphorus, chalk, and gum. Owing to bad effect of the phosphorous fumes on the workers, the ordinary phosphorus was replaced later on by a sulphide of phosphorus, which did not produce harmful effects on the workers, or, hinder the striking of the match. The making of matches has naturally become a very important industry, and several large and extensive match factories exist in this country.

—✠ Attila. ✠—

[By D. PARSONS.]

Attila or Etzel, the Kaiser's prototype, was born probably in 406 A.D., and ascended the throne of the Huns with his brother, Bleda, in 434. They ruled not only over the Huns but over nearly all the tribes north of the Danube and the Black Sea; under their banners fought Vandals, Ostrogoths, Franks, Gepidal, Alani, Heruli, and many other Teutonic peoples. Their dominions are said to have extended from the Rhine to the frontier of China. Attila was regarded by his people with superstitious reverence, and by Christendom with unparalleled dread, and he became known as the "Fear of the World" and the "Scourge of God." He proclaimed that he possessed the iron sword of the

war god, Mars. This instrument he announced would enable him one day to become the ruler of the whole world.

In 441 and 442 Attila and Bleda, with their forces, ravaged Thrace and Illyria and defeated the Romans in three great battles. Peace was made on the Romans agreeing to pay a very heavy tribute to the conquerors. About this time the overweening ambition and jealousy of Attila for glory caused him to do away with his brother, an event which was celebrated as a great victory by the Huns when Attila announced that it had been done by the command of God.

In 445, having founded his capital at Buda, the modern site of Budapest, he again directed his forces against the Romans. He defeated the Emperor Theodosius in three very sanguinary battles, laid waste all the country from the Black Sea to the Mediterranean, Constantinople being the only city that was left standing in the midst of devastation and ruin. This place was saved by its fortifications and by the ignorance of the besieging army. Thrace, Macedon, and Greece were overrun, and seventy flourishing cities were razed to the ground. The Roman empire seemed about to succumb when Theodosius entered into negotiations and made terms with his invader. While matters were being arranged a plot was formed to murder Attila in which the emperor was implicated. The conspiracy was discovered and the barbarian upraised the Christian monarch with his lack of honour and courage. By this peace the Romans had to pay a heavy tribute and cede portion of their territory south of the Danube.

The attention of Attila was now called to the Western Empire. It is said that Honoria, sister of Valentinian, on account of some court intrigue was subjected to severe restraint. She sent her ring to Attila asking him to be her husband and deliverer. The engagement came to nothing, but Honoria's wrongs were used by Attila as a pretext to wage war on her people, the Visigoths. Another reason for this war might have been the demand of the Romans and Visigoths for the return of their fugitives from justice who were protected by Attila. Whatever the cause was, the firebrand Attila assembled 700,000 men and led them through the centre of Germany, crossed the Rhine, defeated

the Burgundians, and pushed on through the heart of Gaul. He met with the first serious opposition at Orleans, and the Huns sat down to starve it into submission. The Romans under Aëtius and the Visigoths under Theodoric, their King, and his son, Thorismund, arrived in time to raise the siege, and Attila retired to the plain of Chalons. There the rival forces concentrated and a tremendous battle ensued. The Romans and Visigoths were at first repulsed, but led by Thorismund they renewed the attack with greater vigour. The battle was very long and bloody, and eventually the Huns were utterly defeated, and had to retire to their camp. Here Attila ordered all the wagons, wooden shields, saddles, and other baggage in his camp to be gathered into a vast funeral pyre, and he resolved to perish in the flames rather than yield to the enemy. This resolution, however, he had no necessity of carrying out, because of the severe price the Allied Army paid for the victory, 100,000 to 300,000 of its dead strewing the field, and so Attila was able to retire into Hungary. Next year Attila who had meanwhile reorganised his army poured his men through the defiles of the Alps. He devastated everything before him including Milan, Padua, and Aquila, and drove the inhabitants to the Apennines and the lagoons of the Adriatic, in which last place the fugitives formed the foundations of Venice. Rome seemed likely to fall before the invader when his course was arrested by an embassy, headed by Pope Leo. The result of the ensuing conference was that Attila withdrew with all his forces, leaving the astonished Romans to conjecture the cause of his withdrawal. Some said that it was due to a vision that Attila received of Saints Peter and Paul, who begged him to retire into his own country. Another version was that Pope Leo bought Attila off with large sums of money. But though the Huns withdrew they left their mark after them, and an idea of their treatment of peaceful people can be obtained from an inscription, found at Aquila after that City had been destroyed, describing the invaders as the "scourges of sinners."

In 453 Attila made preparations for another invasion of Italy, but he did not live to accomplish his object. He died suddenly after his marriage to a Burgundian Princess. His followers, on

hearing of his death cut themselves with knives, shaved their heads, and then prepared to celebrate the funeral rites of their late king. His body was placed in three coffins. The first and innermost was of gold, the second of silver, and the third or outermost one was made of iron. All the caparisons of his horses, his arms, and his ornaments were buried with him, and his captives who were employed to make his grave were put to death after having accomplished their task, in order that no one might betray the position of his resting place. The kingdom formed by him broke up on his death, no one chief being powerful enough to seize the supremacy.

Cage Birds.

[BY J. FITZPATRICK.]

Birds have been kept as pets from the earliest ages to the present time, by the savage as well as by civilised races, and the origin of caging and domesticating birds as pets is lost in antiquity. We can go back to the days of Alexander the Great and we find that he kept a ring-necked parrakeet in a golden cage of fabulous value, and consequently we are not very much astonished when we observe that the keeping of cage birds is a widespread practice at the present day.

Any person who has had any experience with our feathered friends and who has also had the opportunity, to say nothing of the pleasure, of seeing birds of tropical climes, is immediately struck by the great peculiarity which is conspicuous in British cage birds. This peculiarity lies in the fact that the beautiful plumage, which is so common to birds of topical regions, is almost absent in British birds. However, as is the case in most of the things in nature, what is wanting in one sense is made up in others, so is the case with our British cage birds, and consequently we find the soberly clad linnet having a beautiful, melodious voice which has helped it to become the most talented of British finches. On the other hand, if we visit an aviary we see birds of such varying colours that we stand spell-bound with wonder and admiration, but as soon as we hear the sound which proceeds from the throats of these birds we feel almost inclined to run away, so un-

harmonious is the sound or, as it may be truly called, the scream. What a great and well marked contrast then exists between the linnet and the famous and beautiful bird of Paradise!

To most of the rules that exist, whether they be artificial or whether nature has made them, there are always exceptions, so in the case of birds there is an exception to this rule. The goldfinch with its beautiful plumage, elegant form, and beautifully varied song is the most noteworthy exception. The greater part of its plumage is chestnut-brown, while the white-spotted wings, finely contrasted with the black ground on which these spots are placed, and the shining black mantle which covers the back of the skull, greatly augment its beauty. Its song is loud and varied and can be heard almost all the year round when the finch is in confinement. The goldfinch breeds freely in captivity and will rear its young in an ordinary canary breeding-cage. In order to enable the goldfinch to enjoy a contented and healthy life for many years, it is necessary to pay special attention to its food and consequently some thought must be given to the fare which would be obtained by it in nature. Thistles of all species afford its favourite sustenance, while hemp, linseed, and cornflour are devoured with much relish. However, it is not advisable to give a captive goldfinch all it would get if at liberty, as it would soon become too fat.

Conforming in every degree with the characteristics of British song birds is the plain but melodious little linnet. When viewed from a distance its graceful form strikes the eye at once whilst its song, which is sweet and harmonious, falls with no harsh sound upon the ear. Its manners are gentle and docile and it very easily adopts the song of other birds when confined with them. Like the goldfinch it is content with a spacious cage and thrives almost entirely on oily seeds, especially linseed.

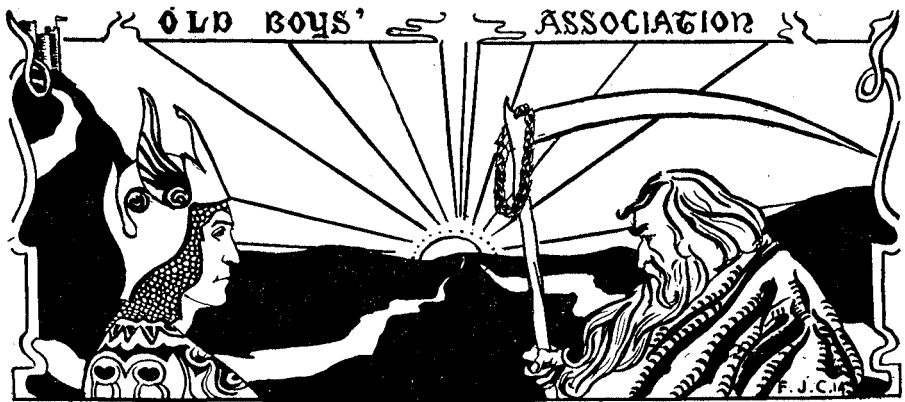
Perhaps the most common of British cage birds is the canary which is indigenous to the islands whence it takes its name. Absence of beautiful plumage is again to be seen in this bird but nevertheless its song is very fine, being loud and clear and, like the linnet, it readily imitates the notes of other birds, even those of the nightingale. Other favourite British cage birds are the bullfinch,

thrush, and lark, but again absence of varied plumage is plainly visible.

The breeding of cage birds is an employment in which a huge number of people are engaged. On the continent, and especially in Germany, the breeding of canaries is carried out on an enormous scale, and it is estimated that two millions are reared annually, half of this number being exported. Belgium was also the home of thousands of canaries which are noted as a fine breed. The task of cultivating the goldfinch with a view of intensifying its outward beauty or its musical ability, has not yet been undertaken. This is rather remarkable, for it is not only in outward beauty that there is better material to hand as a foundation, but in musical talent for the wild goldfinch excels the wild canary. If, then, as much skill were devoted to its selection and breeding for musical capacity as has been used in the production of the canary, the goldfinch would, in a few generations, excel other wild

birds and a small fortune is therefore awaiting some enterprising breeder.

Ailments which afflict all cage birds are in ninety-nine cases out of every hundred due to injudicious and excessive feeding, and it is far better to err on the side of short commons than to feed too highly. Suitable food with a continual supply of clean water and a well-kept cage is essential for the bird's welfare. It is equally wrong to place such pets in a window or such recess where there is likely to be any draught, as the cold affects them just as it would an ordinary person. Although too much food is detrimental to our cage birds, still we must not go to the other extreme, or this in the end would be equally harmful. Consequently, great care should be bestowed on the keeping of cage birds, and if such care is taken we shall not be surprised when we learn that the cage birds will readily accustom themselves to a captive life, which may extend for any period up to twenty years.



EXECUTIVE MEETING.

A meeting of the Executive was held at the Catholic Institute on December 14th, 1914. Mr. D. Hayes presided, and there were present, Messrs. J. A. Curtin, J. F. Lacy, A. Lamble, J. C. Cunningham, G. J. McNally, F. Fennell, W. H. Rowe and the Hon. Sec. Letters of apology for inability to attend were received from Messrs. J. Twomey, J. Toolan and the Hon. Treasurer.

After the minutes of the last meeting had been signed the Chairman referred in very sympathetic terms to the recent loss they had sustained by the death of the late Mr. C. P. Murray, a former President of the Association and one of its most loyal and most enthusiastic

members. No words of his could suffice to express the very deep regard in which Mr. Murray was held by every member of the Association, and he felt sure he voiced the unanimous sentiment of the members when he proposed that the meeting record its very deep and sincere sympathy with the family of Mr. Murray on their sad affliction. The motion was carried in silence, all present standing.

A proposal by Mr. Lacy to the effect that steps should be taken to present a souvenir to the Old Boys who are now serving with His Majesty's forces was favourably received, and a sub-committee comprising Messrs. Lacy, Fennell, Rowe, Curtin and the Chairman was appointed to go into the matter.

It was also agreed that the resolution

which was passed at last Executive Meeting, suspending all the social functions of the Association for this season, should continue in force till the end of the session.

REQUIESCANT IN PACE.

THE VERY REV. DEAN CAHILL.

The death, at an advanced age, of the Very Rev. Dean Cahill, who had been for very many years Rector of St. Marie's, Southport, removes from our midst a very distinguished and much revered ex-pupil of the Catholic Institute. Neither the difficulties associated with advancing years nor the claims of parochial work prevented the Rev. Dean from taking an active interest in his old school, and his patronage was also extended to the Old Boys' Association, at whose annual re-union he was present. May he rest in peace. Amen.

Mr. CHARLES P. MURRAY.

The death of Mr. Charles P. Murray, which took place on 29th Nov., 1914, came as a very painful surprise to a wide circle of friends and acquaintances. He had been in indifferent health for some few months, but nevertheless he attended his business until a few days before the end came, and so his many friends were quite unprepared for the sad intelligence of his decease. Old Boys of the Catholic Institute, and indeed all connected with the school will especially regret the early death of Mr. Murray. Though his school-life terminated some years ago he never really severed his connection with his alma mater. On the contrary, his interest in its welfare seemed to intensify as the years rolled by, and the very exemplary life which he led always reflected much credit on it. Mr. Murray was one of the founders of the Catholic Institute Old Boys' Association, of which he was unanimously elected president during the second session of its existence. He was much and deservedly esteemed by the large number of Old Boys with whom he came in contact, and his untiring zeal for the furtherance of the interests of the Association was much appreciated by them. Much of the success of the Association in recent years was due to his efforts, and consequently his loss will be keenly felt by the members.

Both the Association and the School

were represented at the funeral, and two chaste wreaths—from the Principal and Staff of the Catholic Institute, and from the Catholic Institute Old Boys' Association—further expressed the deep regard which all connected with the Institute had for the deceased. May he rest in peace. Amen.

"OUR ROLL OF HONOUR."

NAVY.

Chief Petty Officer F. J. Maguire,
H.M.S. "Assistance."
Petty Officer J. B. Maguire, R.N.V.R.
G. O'Donnell, R.N.V.R. Naval Brigade.
H. Arnold, " "
L. Cooper, " "
C. Dobbin, " "
J. Leonard, " "
E. Lunt, " "
Fred. Adams, Royal Naval Engineers.
H. Begge, Royal Marines.

ARMY.

VTH BATT., K.L.R.
Major J. J. Shute.
G. Gilmore. E. Gillow.
G. Briscoe. L. Briscoe.
VITH BATT., K.L.R.
Sergeant Morton Rfm. H. W. Smythe
Corpl. T. Mullen " H. Crook
" C. Topping " D. Hetherington
Rfm. A. Rattray " C. Lavin
" T. Gloyne " H. McGrath
" B. Merron " J. Redmond
" W. Lamb " J. Lynch
" W. Doyle " E. H. Jones
" S. Doyle " R. Colligan
" H. Doyle " Jas. Lynch
" E. Rattray " J. Allen
" W. Bramwells.

VIIITH BATT., K.L.R.

Captain R. Keating.
Sec.-Lieut. L. Murphy.
Sec.-Lieut. E. Loup.
Pte. J. Gray.
Pte. J. Fitzpatrick.

IXTH BATT., K.L.R.

A. Cassidy. John Brown.

XTH BATT., K.L.R.

Jerome Sullivan *Corp.* L. Marmion
J. Freyne Malcolm Gray
J. Wilson G. J. McKee
F. Coyne. *C. G. G.*

ROYAL ARMY MEDICAL CORPS.

O.-M. Sergt. J. Llewellyn J. Smith
B. Llewellyn W. Smith
R. Morris A. Byrne
T. Lane J. Rendall
G. Johnson P. N. O'Hara
T. O'Neill T. Curry
T. Everson G. Murphy

L'POOL CITY BATT., K.L.R.

B. Riley Sergt. W. Gilmore
J. A. O'Neill Sergt. E. Concannon
G. McGuinness M. O'Brien
J. McGuinness L. Barber
H. Williams W. Dix
L. Williams H. Torpey

L'POOL CITY BATT. K.L.R. (*cont.*).

C. Murphy	F. Quinn
C. Jones	H. Wilson
G. Lynch	J. Traynor
J. Moore	J. Bailey
R. Moore	G. Rimmer
W. Shortall	J. Hallsall
G. Tugwood	C. Fishwick
F. Thomas	P. Fishwick
P. Scott	C. Lenden
J. Rothwell	O. Winfield
J. Murphy	J. Hampson
L. Barber	J. Riley
J. Fagan	G. Aldecocoea
G. Cuddy	C. Hopkinson
J. Lunt	A. Ramsbottom
H. Ball	C. Schiller
— Cairns	— O'Donovan
L.-Corpl. C. Schiller	S. Smith
L. Flanagan, "L.B.D."	and Canadian Brigade
Harold Berry	do do
D. Jones	do do
R. Fenn	do do
J. Flanagan, South Irish Horse	
F. McKee, Motor Transport Service.	
R. Caldwell	" "
J. Stall, Lancashire Hussars.	" "
H. Cossentine, " "	" "
N. Cossentine, " "	" "
W. McMillin, Army Service Corps.	
J. Jackson,	
F. Roydon, Royal "Flying" Corps.	
F. Cox, Royal Field Artillery.	
J. Leech, West Lancashire Artillery.	
Lieut. E. Doolan, West Lancashire Artillery.	
H. Rhynish, " "	" "
Frank Bullen, " "	" "
H. Begley, South Lincs. Garrison Artillery.	
Jas. Saunders, " "	" "
B. Riley, Xth Batt. Cheshire Regt.	
W. E. Kitts, South Lancashire Regt.	
S. J. McNally, Naval Transport Service.	
R. Lupton, " "	" "
A. Jones, "Pals" Artillery.	" "
A. Black, Middlesex Regt.	
F. Thomas, " "	Yeomanry
F. Deane, Loyal North Lincs. Regt.	
A. Power	
H. McClory, Cheshire Regt.	
Lieut. G. Crean, The "Inniskillings."	
P. Dooley, London "Pals."	
H. Flynn, E. Lincs. Territorials.	
A. Thomas, S. Lincs. Territorials.	
J. Hooker, London "Pals."	
N. Shee, Bristol "Pals."	
J. McKee, London "Pals."	
J. Henderson, VIth Dragoon Guards.	
G. Kieran, Royal Engineers.	

We shall be pleased to have the names and particulars of Old Boys who are "on service," whose names do not appear in the foregoing list.

* * *

Major Shute is gone with his regiment to France, and a report just to hand says they are already in the trenches. The "Sixth," in which is a large number of Old Boys, is also at the storm centre. We sincerely and heartily wish them one and all every good luck and a speedy and safe return to home and friends.

* * *

We have pleasure in publishing the following letter which we received :

"BRITISH EXPEDITIONARY FORCE."

DEAR Sir,

Seeing in the "Universe" that you were looking up all Old Boys of the Liverpool Catholic Institute, who are serving their country, I send you my name. I left the Institute about the year 1897. Father Jeanrenaud was there then, and my master was Mr. Blakely. I am serving with The Royal Flying Corps as a Mechanic. We are having some exciting times here, but I dare not tell you too much on account of the Censor. The weather here is bitterly cold and wet, but we are happy. I would love to have a copy of the list of Old Boys when it is completed. Things are quiet here at present, and as we have got fairly comfortable billets we are having a good time. Give my best wishes to any Old Boys who know me, and remember me in your prayers. Hoping you will all have a bright and prosperous New Year.

Yours sincerely,

F. ROYDEN,

(No. 510),

First-Class Air Mechanic.

* * *

Phil O'Hara is stationed with the R.A.M.C. at the Hospital, Boulogne. He writes : "We live on a modest scale. Nevertheless we are more or less enjoying ourselves. It is great fun watching the soldiers gesticulating to the French people, and we can work up any amount of sundry amusements. A German soldier died in the hospital yesterday. He was shot in the arm, and lay on the field four days before he was picked up, not by one of his own R.A.M.C. but by one of ours. By that time the wound had become poisoned, and though his arm was amputated (and he bore it very bravely) he soon died. We could not of course cover him with a Union Jack, so I had to go to some cottages to borrow a black pall. When he was brought in he asked—"You are not going to drown me, are you?" He was a sniper and often spoke of the number of English he had killed. I am still anxious in spite of the horrible sights one sees and the horrible tales one hears, to get attached to a field ambulance so that I may see the real thing. For the present I can only live in hope."

* * *

E. F. Concannon won the middle-weight boxing championship of the 3rd Battalion of the "Pals" on Boxing Day.

* * *

W. J. Rawlinson, who for some years has been stationed at the Waterloo branch of Parr's Bank, has been transferred to their St. Helen's Branch, and has had to take "digs" in the city famous for — pills.

* * *

Fred Tindall is busily engaged making shells for the British and French Armies at the British Westinghouse Co.'s works in Manchester. The other day he gave a learned and interesting paper to the Manchester Institution of Electrical Engineers on "Accumulators."

* * *

John Reardon, who is with the "Cheshires" in Bournemouth, has been promoted to the rank of Sergeant in charge of a machine-gun section. He was home for sometime early in the New Year suffering from a bad throat, but he speedily recovered.

* * *

Barney Maguire sailed from — on Feb. 27th for a destination unknown. The "Daily Post" stated a few days later that part of the Liverpool section of the Naval Brigade is engaged in the Dardanelles, but whether Barney is there or not we cannot say. A cryptic reference in a letter just to hand, in which he says much about the Censor, reveals the fact that he is in the Mediterranean.

Frank Maguire is still on H.M.S. "Assistance," the first repair-ship of the Navy. He has had several narrow escapes from German submarines and mines. However, he does not hold a very high opinion of the German Navy. Both paid us a brief visit a few weeks ago.

All Old Boys will learn with regret that Mrs. Maguire has been unwell since Christmas, and will wish her a speedy and permanent recovery.

* * *

A week or two back Liverpool was crowded with the "Sixth" on leave preparatory to going to France. A great number of Old Boys were amongst them, and, now that they have attained their heart's desire and have reached the firing line, we know that they will be a credit to their school, their city, and their country.

* * *

We much regret that owing to a printer's accidental omission the names of James Wilson of the Liverpool Scottish and J. Flanagan of the S.I.H. were left out of our "Roll of Honour" in our last issue. This was all the more unfortunate as they had left for France, the former just two days before the Magazine was published, and the latter with the first Expeditionary force.

* * *

Lawrence Marmion, who is with the "F" Coy. of the Liverpool Scottish, has been in the firing-line since November, and has taken part in some terrific fighting. He suffered from frost-bite, but was only a short while away from his post at the front.

* * *

We tender our very sincere sympathy to Messrs. J. & R. Cunningham on the death of their father, which took place rather unexpectedly a few weeks ago. Eternal rest give unto him, O Lord.

* * *

News just to hand reveals that we were strongly represented at Neuve Chapelle on March 10th, both the Vth and VIth were there. We regret to hear that Charlie Topping was wounded and is in hospital. This is the only "Casualty" we have heard of, and we are grateful the list is thus small. A "card" from Harry McGrath two days later brought the pleasing intelligence that he was quite well. We have also heard that Joe Allen got through it unscathed. That they may have the divine protection throughout the terrible ordeal in which they are engaged must be our incessant prayer for them.

* * *

We are pleased to note that Eugène Goossens continues to make his impress on the musical world. The following appeared in a recent issue of "The Daily Telegraph": "Among those whose musical doings have aroused not a little interest of late a prominent place must be given to Mr. Eugène Goossens, jun. His symphonic poem, "Perseus," the most elaborate and the most ambitious work from his pen that has yet been produced in London, created a very deep impression when it was played at one of the Queen's Hall Promenade Concerts last Autumn, and made it clear that he has it in him to write fine music. Any opportunity, such as that afforded at a private concert at the Great Central Hotel yesterday afternoon, of making the

closer acquaintance of his work is in consequence very welcome indeed. A glance at the programme was enough to show that it was not intended to display Mr. Goossens in his most serious mood. Nearly all the pieces that he contributed to it were trifles light as air, and very dainty, very delicate, and very imaginative did most of them prove. The flute Romance, played by Mr. Victor Borlée, is a really delightful little piece. There are many exceedingly pleasant moments, too, in the four "Esquisses" for flute, violin, and piano, in which the composer, as pianist, was associated with Mr. Borlée and Mr. André Mangeot, and in the Five Impressions of a Holiday for flute, violoncello, and piano, in which Mr. Cedric Sharpe was down to play the violoncello part. In all of these Mr. Goossens has aimed at simplicity, but there is, even in his least ambitious music, a savour of freshness and individuality which is extremely welcome, and which gives one good reason not merely to hope, but to expect much of him in the future.

* *

We tender our heartiest congratulations to Messrs. J. V. Quinn, R. B. Cunningham, H. Llewellyn and J. Fletcher, all of whom have recently succeeded in getting Civil Service appointments, Mr. Quinn in the Second Division Clerkships and Messrs. Cunningham, Llewellyn and Fletcher in the Customs and Excise. Messrs. Cunningham and Llewellyn are attached to the Liverpool Staff, while Messrs. Quinn and Fletcher have been appointed to London.

OUR U.S. LETTER.

Joe McNulty sends us a long epistle from the "land of neutrality," but we regret that space forbids us to insert it *in toto*. He writes: "None of us are millionaires. John D.'s great ambition is to set Ireland free and to be a public speaker."

His brother, Joe Leo, wants to be the chief executive of the United States Steel or of the Carnegie Iron Works. Billy Rafter wants to see a Cup Final once more before he dies. I want, I want—I do not know. What more, above the necessities of life, does an easily contented soul require than a bed, a pipe and the wherewithal to fill it, a book, a horse and a dog? And I have them all except the dog.

A year ago, the Colgans, Rafter and I lived in New York, Raf. in the Bronx, we three in Fiftieth St., where we had maintained a happy-go-lucky ménage off and on for over two years. Anyone who has endured the trials and delights of "backing it," will understand the daily dispute concerning the office of dishwasher, the arguments concerning the wearing and ownership of ties, etc. My great complaint was that my voice when raised in song was not appreciated. Now, Gounod's "Ave Maria" is a beautiful song, and only a few singers can do it justice. Caruso sings it well, and Amato is not bad. Therefore, when I start, you would imagine that the Colgans would be spellbound. They are *not*. Joe Leo goes on polishing his shoes (he was not married then), and Jack continues reading the "Irish American." You know the line "Sancta Maria" is repeated, and the last note of "Maria" falls on a flat or a sharp or something else, too technical for me to discuss now. Just as I reach the fatal note, the polishing ceases, the "Irish American" is rolled into a ball, and the fight begins.

However, in spite of these differences, may be on account of them, we lived together like the happy family in the circus, until the summer came. Summer in New York as an apprenticeship to eternal incandescence, may have its points, but we are more optimistic regarding the hereafter, and with the exception of Raf., we beat it for the open country. John took a couple of guns, and went hunting, and living the life of a pioneer in the woods. Joe Leo stayed on a Pennsylvania farm. I went down to the sea-shore on Long Island.

Afterwards Jack took up pig-culture in Vestal, N.Y. Joe returned to town, got married, and is now, more or less, settled down. From Long Island I travelled to Boston and wandered round generally from Maine to Virginia, finally coming to roost on the western slope of the Alleghannies, where I am at this writing, and doing nicely, thank you.

Occasionally I have a letter from Joe Leo, but I owe Billy Rafter three bones. Some day I will receive a card from John "coming down on the 607. Got a scheme to make money. J. D. C." Soon after he will arrive, and endeavour to persuade me that there is a fine market for hair dye among the blond Eskimos, or that we should charter a tug and tow an iceberg from Greenland

to Cuba, where we could dispose of it at a great profit. Perhaps the scheme will be to buy an interest in a peanut stand or a bootblack parlour. At any rate after discussing the matter carefully, we shall mutually agree to drop it, and John will go away to develop another brilliant idea. He will hit the bull's eye some day, I will wager. Now patient editor, I admit that I have given you but little news, but the *raison d'être* of this letter is to let the people at home know four Old Boys at least, have still got their heads above water in this land of neutrality, and would be very willing to hear of any others who may be living this side of the water. I for one would not be offended if I received a line occasionally from any of my old friends. Where is Dowdall these days? and Marmox? and Billy Power? Where is Tom McNally, who was known as "The Nail"? How is John Willy doing? If these lines are seen by any of the above mentioned, let them know that a word of greeting would be more than welcome here, over a hundred miles from a town, in a country that has been snow-bound for two months, and will be mud-bound for another two.

And so reluctantly closing (for once started we are hard to stop) with best wishes to you all that a peace with honour will soon come and stay long in Europe.

I remain, yours, etc.,
JOS. P. McNULTY.

'VARSITY LETTER.

DEAR MR. EDITOR,

As one would anticipate, our doings at the 'Varsity this term have not been of a very exciting nature. We are still keeping our turbulent spirits under control, but the term has certainly been brighter than its predecessor. One or two isolated socials have been held, and these have been eminently successful. Of these, perhaps the most interesting was the Catholic Society's Social. We were entertained for the first-half of the programme with numerous musical items, all of a very high standard, and after refreshments we gave ourselves whole heartedly to the pleasure of dancing. To an old C.I. pupil the evening was particularly attractive as our old friend Mr. V. Atkin acted as pianist, and was as successful as he used to be, when acting in the same capacity at the famous C.I.O.B. "smokers." Mr.

T. Quirk also obliged with "Mandalay" and the "Old Bargee," which were also enthusiastically welcomed by the C.I. Old Boys.

It was with regret, however, that we learnt that "Panto Night" was not to be this year. This festival was always regarded as the red letter night of the "'Varsity" year, but of course it was universally agreed that the celebration would be out of place this year. So Liverpool will miss (?) the cheerful noisy procession that has been such a source of pleasure in the past. Perhaps, from the point of view of sparing the feelings of the Prussians, it is just as well, for one trembles to think of the results of undergraduate ingenuity in caricaturing the War Lord and his advisers.

The Irish Society has had a flourishing session, many of its meetings being of exceptional interest. The Dramatic section is particularly good, and all members enjoyed the rendering of "The Bride." This month those following their amateur career behind the footlights are turning their attention to comedy and will present "Paid in his own coin." The C.I. Old Boys are well represented in both societies, and we have to congratulate Mr. G. Kirby on his election to the council of the Irish Society.

As regards examinations, the usual report has to be made. A glance at the terminal examination lists shows that our Old Boys at the 'Varsity are still maintaining the high standard for which they have always been famous. We can look forward, therefore, with confidence, knowing that our representatives will do equally well in their public examinations at the close of the session. With this optimistic, but fairly safe prophecy, we must ring down the curtain on this term's events.

Yours, etc.,
'VARSITY.

* *

We have just heard that Charlie Topping was seriously wounded at Neuve Chapelle and is now in Dublin. E. Rattray was also wounded in the same engagement. We offer them both our sincere sympathy and wish them a very speedy recovery.

* *

A. Jones has joined the new County Palatine F. Artillery.

LONDON LETTER.

LONDON, *March*, 1915.

To OLD BOYS' EDITOR, C.I.M.

SIR,

In extenuation of this little scrap of paper, (which would mean the sack from an Editor less magnanimous and less kindly disposed than yourself, and may, for all we know, actually prove to have that significance), we can only plead that after the publication in the last issue and in sundry dailies and nightlies of the goodly list of militants from the C.I., compiled with such admirable energy, there remains little more to be said. That list speaks for itself. Expatiation on the splendid share of the work that our fellows are doing would be superfluous: we have only to express our condolence with those of our friends who, like ourselves, are obliged, much against their inclinations, to stay at home.

London has been chiefly remarkable during the last few months for Calls to Arms, marching men, a surfeit of search-lights (a plausible explanation of which is that the intention of the authorities has been to disguise London as the British Navy afloat), rain, frankly British placards, and of course, streetfuls of pallid citizens trembling in the last stages of bombophobia, exactly as depicted in the German comic papers.

We should like to be able to record some of the experiences abroad of certain of our friends from the C.I., but so far, probably owing to circumstances which our friends deplore as much as we do, our post-bag is mainly composed of several gross of those stereotyped buff postcards with which everyone is now familiar, and which are not given to circumspection, bearing generally the inscription:

"I am quite well.

I have received no letter from you for
a long time."

It is not irrelevant at the present time to recall a few lines written by Mr. Kelleher and published in a previous issue of the Magazine:

"Oh, God, Who made the lightning and gale,
Oh, Lord, Who taught our hands the might of
steel,

Remember all the bitter woe we feel,
Give us some other force that will avail,
Lest fire and metal idols rise again,
And thou, the Lord of Peace, be scorned by
men."

With kindest regards to all,

Yours etc., R.A.C.

The Building of a Big Ship

[By T. HONAN.]

There are few if any more beautiful sights than a huge steamer cleaving her way full speed ahead through the open sea or coming majestically to her berth at the quay side. Her towering funnels, her huge hull, contrasting in size so strongly with the pigmy passengers and crew, make one wonder how puny man can fashion such an enormous ark to carry thousands of his kind across the waters of the ocean.

Shipbuilding is a very complicated business founded upon many mathematical formulae of a type formidable enough to frighten intelligent seekers after knowledge in the field of naval construction. Even the practical work of piecing together the thousands of parts which go to the making of a ship requires very skilled labour, since nothing but the very best is good enough for the leviathan which is to withstand the hardest buffets of Old Neptune.

When a shipping company which requires a new vessel, has made up its mind as to her size, speed, and capacity, the first step in the process of construction is the marking of various drawings. These are of two kinds—the "sheer draught" and the "detail drawing." The sheer draught consists of drawings showing the dimensions and shape of the vessel's outer surface before the plating is put on—that is the outside dimensions of the mere framework. As the ship has length, breadth, and depth it is necessary that there should be three of these drawings, the measurements of which must correspond. In addition there is the "body plan" which comprises from twenty to thirty drawings, each showing the curves of the ship's cross-section at different parts in its length.

The "detail drawings" comprise the profile, or the section from stem to stern, giving a side view of how the decks and bulkheads are to be placed; the deck and hold plans showing the various decks as seen from above; and the midship section showing the arrangement and sizes of the frames, plating, and other parts used in the construction.

In the case of a vessel which in design, size, and speed is to differ from existing examples—the "Mauretania" was such a case—on the completion of the plans it is necessary to make

experiments with a model before finally deciding on dimensions, lines, power of engines, etc. This is usually done with a wooden block or a hollow casting of paraffin wax, shaped to the contours of the "sheer draught" by special machines. When it has been finished and polished, it is transferred to an experimental tank, and loaded until it sinks to a certain level. A large carriage spanning the tank tows it through the water at speeds which are mechanically recorded, as are also the pull required to move the model at any given speed and many other particulars. If the resistance of the water proves excessive, the shape of the model is altered until it gives satisfactory results. The final designs are then made.

In the case of the "Mauretania" the tests made with the wax model were supplemented by those of a large launch, forty-seven feet long, driven by electric accumulators and motors carried on board, run in a large dock, on the river Tyne. This model was built of wood and so constructed that its shape and the positions of the propellers could be modified within certain limits. By means of delicate instruments information of many kinds was collected as regards the best relative speed; position and curvature of the propellers; friction of the launch's surface against the water; and several other matters and details.

It is interesting to notice that the several designs of propellers recommended by different authorities as the most efficient were found to vary amongst themselves by as much as twelve per cent. in their actual efficiency. In the case of a ship of the size of the "Mauretania" the wastage of twelve per cent. of the engine power would mean a huge extra coal bill every trip, and the experiments of the type referred to would have been fully justified had they only served to prevent such a loss of power as the adoption of a bad design of screw would have occasioned.

As for the actual building of a ship, there are many different systems of framing, each adapted for a certain purpose. The structure of a warship differs widely in some respects from that of an Atlantic liner, and the liner in turn differs from the purely cargo boat, which must have capacious holds. Generally, the first part constructed is the keel which, in the "Mauretania," consists of a steel girder, 50 inches wide and $3\frac{1}{2}$ inches thick, and which runs along the

centre of the vessel, and forms its lowest part. On either side of the keel there are seven girders which stiffen the bottom fore and aft, while the floor beams, running athwart the bottom, connect the girders and stiffen the bottom of the framing from side to side.

To describe fully the frame-work of a vessel would involve the use of hundreds of technical terms. This framework consists of the curved ribs which rise from the outermost girders of the bottom on each side and are held in position laterally by the deck-beams, bulkheads, etc.

The skin of a ship consists of a number of plates of various thicknesses and sizes. Amidships, the "Mauretania's" plating is one inch thick, except near the keel, where it is $1\frac{1}{8}$ in. thick, and at the tops of the sides which carry plates of double thickness. The plating is laid on the frame in strakes which correspond to courses of bricks in a wall or boards in a wood-covered house.

Each strake is composed of a number of long plates joined by their ends. The heaviest plates of the "Mauretania" are 48 feet long and weigh from 4 to 5 tons each; the ordinary plates are 34 feet long, and from $2\frac{1}{2}$ to 3 tons in weight. The placing of the many plates is also a rather complicated technical operation.

The girth of a ship amidships is much greater than near the bow and stern, consequently the area of plating tapers away fore and aft, and the breadth and number of the strakes must be suitably decreased. The inside strakes are put first. For every plate a pattern or template of thin boards is made somewhat larger than the plate. It is clipped in position on the frames by bent irons and on it are marked the edges of the butts (the parts which overlap, or are overlapped by, the adjacent plates in the same strake); the edges of the plate, and the position of the rivet holes in the frame to which the plate will be attached. The template is removed and clipped to the steel plate, to which the position of the frames and rivet holes are transferred in white paint. Then the holes for the edges and ends are marked, and the plate is punched, planed at the edges, and bent to the shape of the frames. The inside strakes having been bolted into position on the frame, the outside strake templates are prepared in like manner and the plates are marked and punched.

Then follows the riveting which is performed with mechanical tools. As it is necessary that all outside rivets should be absolutely watertight, great attention is given to their shape and to that of the rivet holes. Every rivet is carefully inspected after being closed, and all defective ones are replaced.

The joints are usually tested by water under pressure. This done, the plates are scraped and painted.

Simultaneously with the plating and riveting the laying of decks and the erection of bulkheads have been proceeding. The screw tubes, screws, and rudder having been placed, and much labour expended on the metal work of the interior, the time is at hand for the launching.

A road of timber is built from the ship to the river—in the case of the “Mauretania” the river in question was the Tyne—and a construction of timber is fixed to the ship’s bottom to give it a flat base. As there are no rollers in the structure tremendous friction would be set up between fixed and moving timber, unless the rubbing surfaces were well lubricated, so these surfaces are freely smeared with greasy substances. For the “Mauretania,” 17,150 square feet of ways had to be lubricated with $14\frac{1}{2}$ tons of tallow, 22 cwt. of soft soap, and 113 gallons of train oil. At a given signal the hydraulic rams that had hitherto prevented the ship from moving were released and the giant vessel crept forward slowly but gradually increasing in velocity as it went, till, when it took the water it was rushing along at fifteen miles an hour. Careering through the water it seemed inevitable that it should ground on the opposite bank of the Tyne. But five 80-ton chains were acting as a drag on the huge mass, and within a few feet of the bank it was brought to a standstill.

After the launching, the machinery for driving the ship is lowered into its body by powerful cranes. These turbines are of tremendous power, for according to the contract they have to be able to propel the vessel through the water at a speed of twenty-five knots an hour, and can develop 68,000 horse power. When these had been placed in position all that remained to be done to the ship is to furnish and beautify the interior.

R.M.S. “Mauretania” was then ready for her trial trips.

Athletics.

FOOTBALL CLUB.

Our football barometer has been exceptionally low during the past term, probably because the “Standard” has been disquietingly depressed ever since we returned after the holidays. Several half-holidays went by without a game, and it was only when February had begun to wane that we seriously donned our football “togs.” The War and the weather have damped the enthusiasm of many, and our First XI did not escape the general depression. Indeed their exhibitions have occasionally been despondent, and the temporary lapses into their usual good form only intensified their failures in the games that have been lost since Xmas. On the whole the season has been very successful. The first XI played fifteen games of which they won nine, lost four and drew two. The second XI played eleven games of which they won 7, lost two, and drew two.

The teams in the senior league played their games with considerable enthusiasm. Though often interfered with by the exigencies of the first and second XIs they fulfilled all their fixtures, and most of the games were well contested. We give below a table of results which shows the position of the different teams at the end of the season. The two top teams play for the Senior Cup Championship.

We understand that the Junior League was abandoned before some of the teams had completed their fixtures, consequently we are unable to give any particulars of the feats performed by our junior footballers in this season’s league. The Junior Cup Competition which has just concluded and the results of which we give below evoked a good deal of enthusiasm.

FIRST XI.

C.I. v Liverpool Institute.

Played at Sefton Park on Dec, 9th. C.I.; Godwin; Flanagan, Lovat; Walsh, Holland, Meehan, McClory, Nolan, Kennedy, Byrne, Shennan;

Both teams turned out at full strength, L.I. anxious to avenge their previous defeat. The visitors kicked off with the breeze in their favour, and for the first few minutes began to press the C.I.

lefence. The game immediately settled down to a hard battle, in which the visiting centre-half was very prominent. L.I. centre-forward started the scoring with a clever goal, which was soon followed by another from their centre-half. C.I. quickly rallied, and after hard pressure Shennan scored. Half-time: L.I. 2, C.I. 1. In the second-half the play was even more determined. Byrne equalised for C.I., but L.I. outside left gave his team the lead again. McClory came to the rescue, however, and a good game ended with the score, C.I. 3, L.I. 3.

C.I. v S.F.X.

Played at Clubmoor. Team: Godwin; Flanagan, Lovett; Walsh, Holland, Meehan; McClory, Nolan, Kennedy, Byrne, Shennan. The C.I. won the toss and kicked with the sun at their backs. In the first-half play was very evenly contested, and was characterised by much mid-field work. Our forwards soon got into their stride, but their attempts at finding the net were frustrated by the splendid play of S.F.X. keeper. Play was soon transferred to our half where the opposing outside right coming close in scored a rather easy goal.

Just before half-time the S.F.X. centre-half essayed a long shot at our goal which appeared to go behind, but the referee after some hesitation awarded a goal. At half-time the score was 2—0 in the favour of S.F.X.

In the second-half we were no more fortunate, and though at times our forwards were apparently aggressive, they did not succeed in scoring. At the other end S.F.X. obtained two goals through their centre-forward whilst we replied with a goal from Byrne. Though the game ended with a substantial balance against us it was evenly contested throughout, and it was entirely due to the feeble and indifferent play of our forward line that we did not at least draw even.

C.I. v Holt.

Played at Sefton Park. Team: Godwin; Meehan, Sullivan; Walsh, Anderson, Cunningham, Smith, Shevlin, Kirby, McSorley, Clancy. It was raining slightly when Kirby kicked off for the C.I. From the start the C.I. defence was hard pressed, but Godwin in goal managed to keep his charge intact. The strong wind was however a big advantage to Holt, who scored after play had been in progress for twenty minutes. Holt

continued to press, but Anderson relieved the pressure by a huge punt up the field, where the ball was secured by Kirby, who equalised for the Institute.

In the second half our forwards, now playing with the wind were more aggressive, and following upon an exciting scrimmage in the Holt goal, Kirby forced the ball into the net. There was no further score at full time. Result: C.I. 2, Holt 1.

C.I. v Bootle Secondary School.

Played at Sefton Park. Team: Godwin; Flanagan, Lovett; Walsh, Holland, Meehan; McClory, Nolan, Kennedy, Byrne, and Shennan. The C.I. won the toss and elected to kick with the wind. From the outset the Bootle forwards attacked vigorously and scored two goals, when play had only been in progress for fifteen minutes. Our forwards then got into their stride, and following upon a vigorous attack upon the Bootle goal, Nolan scored from short range. Shortly after the same player added another. Just before half-time Kennedy obtained a third goal for the C.I. At half-time the result was 3—2 in our favour. In the second-half our forwards continued their attack upon the Bootle citadel, and Kennedy and Nolan obtained a goal each, whilst Bootle did not succeed in penetrating our defence. Result: C.I. 5, B.S.S. 2.

C.I. v Birkenhead Institute.

Played at Bebington. Team: Irvine; Flanagan, Lovett; Walsh, Holland, Meehan; Callaghan, Nolan, Kennedy, Byrne, Shennan. Birkenhead won the toss, and the C.I. started with a slight wind in their faces. The slippery state of the soil owing to recent heavy rains made accurate play impossible. From the start the Birkenhead forwards were very aggressive and forced a number of corners, which however did not result in anything. Play was soon transferred to the Birkenhead end, where Callaghan struck the post with a fast shot. Just before half-time the Birkenhead centre placed his side ahead with a shot, which gave Irvine in goal no chance. The second half was similar to the first, save that Birkenhead who were a little more aggressive, succeeded in scoring two more goals, whilst we were unable to reply with a single goal. This was undoubtedly the poorest exhibition of football which we have given during the season. Result: B.I. 3, C.I. 0.

C.I. v C.I. Old Boys.

This match was played at Sefton Park. The Old Boys were strongly represented, and the game proved very interesting throughout. The Old Boys were the first to attack, and T. Curtin grazed the crossbar with a well timed effort. At this junction play was evenly contested, both goals being visited. Just before the interval T. Curtin finished up a fine individual effort by placing the ball in the net. Half-time: C.I.O.B. 1-0. In the second-half the Old Boys added two more goals, whilst the school was unable to register a single point. The scorers for the Old Boys being Clancy and J. Curtin. Result: C.I.O.B. 3, C.I. 0.

SECOND XI.**C.I. v Liverpool Institute.**

C.I. travelled to Greenbank Park in full strength, eager to avenge their former defeat. From the kick off we asserted our superiority, and Parsons soon scored from a mis-kick by one of our opponents. After this the C.I. attacked again, but were beaten off, and the L.I. forwards made rapid progress on the right. Sullivan, however, got the ball, and we made another attack on the L.I. goal. Flynn got in a first rate "header," which beat the L.I. goal-keeper to the world, just on half-time.

On resuming play the L.I. forwards took the offensive and soon scored a goal. C.I. replied, but were again stopped. Our defence was now well tested and was not found wanting. Another attack by the C.I. resulted in Riley netting the ball with a fine first-time shot. L. I. now pressed hard and scored another goal, and just on full time drew level with us. Result: C.I. 3, L.I. 3.

C.I. 2nd XI. v. S.F.X. College.

Play at Wavertree on a very cold day this match had been eagerly looked forward to after the first meeting of these two teams. C.I. won the toss, and soon made progress on the right. The play was then transferred to our half by our very heavy opponents. Our defence proved equal to the occasion, and after much mid-field play Smith made a brilliant dash along the wing, and having eluded several opponents, put in a shot, which gave the S.F.X. goal-keeper no chance, and put us one goal up. S.F.X. replied strongly, but were beaten off time and again: C.I. now had hard lines for

another goal, and just on half time S.F.X. netted the ball.

Immediately on resuming play we pressed hard on the S. F. X. goal, and Smith headed in from a corner. Soon after Smith scored again with a strong shot, but then S.F.X. began to use their weight, and by full time had drawn level with us. Full time: C.I. 3, S.F.X. 3.

C.I. v Birkenhead Institute.

C.I. played a strong team at home for this match, and our opponents could do little against us. They seldom got anywhere near our goal, although from one rush in the second-half they succeeded in scoring their only goal. All our team played well as the score shows. C.I. 8, B.I. 1. Scorers: O'Neill (1), Flynn (2), Parsons (5).

THE SHIELD COMPETITION.**FIRST ROUND.****C.I. v Calday Grange G.S.**

On Feb. 10th we again entered the Shield Competition, playing Calday Grange in the first round. The match was played at Sefton Park in fairly good weather, and we were represented by — Godwin; Sullivan and Meehan; Walsh, Anderson and Cunningham; Smith, McSorley, Kirby, Shevlin and Shennin. The C.I. won the toss and kicked off up the slope against a fairly strong wind. Anderson was soon prominent in the centre, and a good chance was lost by his being winded in the opponents' goal-mouth. From the resulting throw-up, play was transferred to our half. After some midfield play, Calday's inside right opened the scoring by a long shot, which beat Godwin. On kicking off the C.I. forwards remained on the defensive, and on one occasion Meehan had to cede a corner, but this resulted in nothing. The Calday forwards and half-backs taking advantage of the weather which greatly favoured them, made determined attacks on our goal, and soon the inside-left increased Calday's lead. C.I. now commenced to attack, Anderson performing very strong work, but in spite of all their efforts two more goals were registered against them when the half-time whistle blew. At the restart, the whistle blew before five of our men had entered the pitch. The Calday centre-forward kicked off, and a second later one of their forwards shot into our empty goal. This goal, however, was concedingly disallowed by the referee, and

the kick-off was taken again. The C.I. forwards now made determined efforts to score, and kept the play in their opponents' half. Soon after starting, Smith, receiving possession, dribbled smartly down the wing, and centred the ball well, just before he was charged down by the full-back. Kirby received the pass, and spoiled a rather good opportunity for scoring by shooting wide. After an interval of play, in which C.I. did most of the pressing, Kirby again received the ball and shot, but the goalkeeper succeeded in punching the ball over the bar. From the resulting corner the ball was cleared, and after some mid-field play, the Calday forwards gained possession of the ball, and the inside-right again scored. Nothing daunted, however, the C.I. forwards pressed again, and Kirby again was unfortunate. Shennan got away on the left two or three times, but he finished weakly, and his attempted centres proved fruitless. On the whole the C.I. defence was very reliable. Godwin made some very fine saves in the first-half, and both backs played cool, steady games. Our half-backs were weak, except Anderson who was by far the most prominent player on the field. The forward line was none too

strong, Shevlin and Smith being the most outstanding features. Calday had a tremendous advantage in weight, and they used this well, thus preventing our forwards and half-backs from attacking very strongly. The game ended in favour of Calday Grange by 5 goals to nil—the exact reverse of the score by which we defeated them five seasons ago when they were last heard of in the Annual Shield Competition.

JUNIOR CUP COMPETITION.

FIRST ROUND.

IIIA—1 goals	...	IVC—5 goals
IVB—2 „	...	IIIC—1 „
IVD—0 „	...	IVA—4 „

SECOND ROUND.

IVC—3 goals	...	IVB—2 goals
IIIB—2 „	...	IVA—1 „

FINAL.

IIIB—6 goals	...	IVC—7 goals
--------------	-----	-------------

SENIOR LEAGUE TABLE.

	Won	Lost	Drawn	Gls. for	Agst.	Pts.
V. ...	3	1	2	16	11	8
IVa ...	2	2	1	12	6	7
IVb ...	3	2	1	11	10	7
R ...	0	5	4	7	14	2

The Catholic Institute,

(Recognised Secondary School for Boys),

HOPE STREET, LIVERPOOL.

Under the Patronage of the Archbishop and Clergy of the Diocese,
and under the Direction of the Christian Brothers.

THE Course of Studies, which has been approved by the Board of Education, affords a good, sound, liberal education, well adapted to those entering the Church, the Learned Professions, Commercial Life, or the Civil Service. Special attention is given to the Religious Training of the Pupils. Pupils who have completed the approved Course are specially prepared for the Scholarship Examinations of the Liverpool University and for the various Civil Service Clerkships. Those desirous of adopting a commercial career can get special instruction in commercial subjects. Facilities are provided for organised games on the Wednesday and Saturday Half-holidays.

FOR PROSPECTUS APPLY TO THE PRINCIPAL.