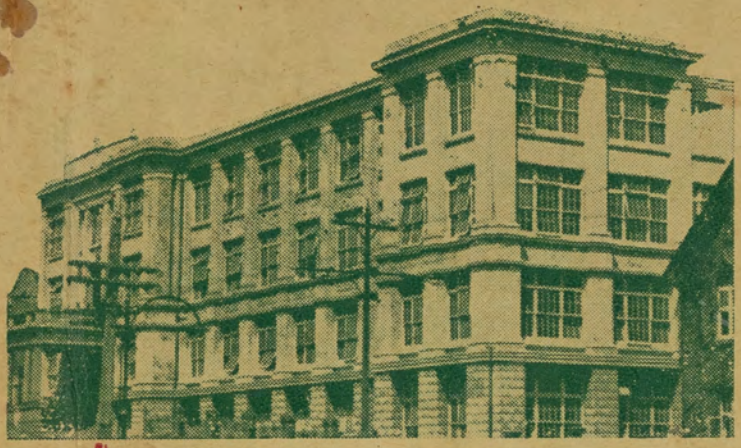

The Seddonian

DECEMBER 1934

The SEDDONIAN

1934

The Journal of the
SEDDON MEMORIAL
TECHNICAL
COLLEGE

AUCKLAND, NEW ZEALAND

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Mr. L. E. Titheridge	M.A., A.I.Mech.E.
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Mr. R. M. Webber	B.Sc., Assoc. Elect. Eng. A.U.C.
Mr. L. S. Wood	M.A.
Mr. E. C. Wooller	M.A., Dip. Journalism, Dip. Education
Miss E. I. Wright	Dip. H.Sc.

THE COLLEGE.

—By courtesy of "Auckland Star."

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Betty Brooke	J. Burgoyne
Daphne Brown	M. Lund
Olive Cooper	P. O'Dowd
Betty Judge	R. Stevenson
Ruth Norrie	C. Thorpe
Althea Pallister	R. Turnbull
	S. Wallace

Councillors.

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Margaret Arroll	L. Broberg
Connie Clayton	S. Duncan
Muriel Lendrum	J. MacAndrew
Dorothy Mansfield	A. Thompson
Kathleen Minola	C. Tibbetts
Joyce Nicholson	T. Woodward
Connie Willoughby	
Florence Woodward	

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Accountant: Miss E. Laking.

Evening Records: Miss T. H. Clough.

Book Room: Miss J. Cleal.

Day Records: Miss J. E. Stanley.

Librarian: Miss K. M. Irving.

SCHOOL OFFICERS OF 1934.

"Seddonian": Editor, Mr. E. C. Wooller.

Cadet Corps: O. C., Captain Scott.

Infantry Battalion:

A Company, Captain Wood, Lieutenant Wooller.
B Company, Captain Thompson, Lieutenant Adams.
C Company, Lieutenants Leeves and McRobie.
D. Company, Captain Davis, Lieutenants Brooke and E. James.
Artillery Section, Lieutenant Carnachan.

Games Organiser: Mr. Burley.

Cricket: Messrs. Taylor (1st XI.), Drake, McKillop, Wooller. Stewart, Wood, Cowperthwaite.

Football: Messrs. Titheridge, Scott, Wooller, Webber, Smyth, Drake, McCombs, McKillop, Brooke, Adams.

Athletics: Messrs. Leeves, Titheridge, Webber, Wooller.

Basketball: Misses Lee and Adams.

Tennis, Boys: Messrs. Carnachan, Taylor. **Girls:** Miss Vickery.

Houses:

Binns, Misses Adams, Kissling; Messrs. McKillop, Wooller.

Hindley, Misses Vickery, Aitcheson; Messrs. Drake, Adams.

Seddon, Misses Boynton, L. Anderson; Messrs. Carnachan, Brooke

Wellesley, Misses Lee, Stubbs; Messrs. Wood, Stewart.

Orchestra: Mr. Burley.

School Concert and Choir: Messrs. Thompson, H. James, Wood.

Savings Bank: Mr. Jones.

Shooting: Mr. McRobie.

CAPTAINS OF SCHOOL TEAMS.

Basketball:

A Team, Althea Pallister.
B Team, Olive Cooper.

Rugby:

First XV. (Second Grade), M. Wakefield.
Third Grade, W. Malyon.
Fourth Grade, I. Jensen.
Fifth Grade A, T. Morrison.
Fifth Grade B, N. Sergeant.
Sixth Grade A, E. Bundock.
Sixth Grade B, L. Waldron.
Seventh Grade, H. Gearing.

Cricket:

First XI., M. Wakefield.
Second X., I. Hitchings.
Third XI., J. McAneany.
Fourth XI., T. Fry.
Fifth XI., J. Campling.
Sixth XI., F. Hardman.
Seventh XI., B. Wells.

CONTENTS

Editorial

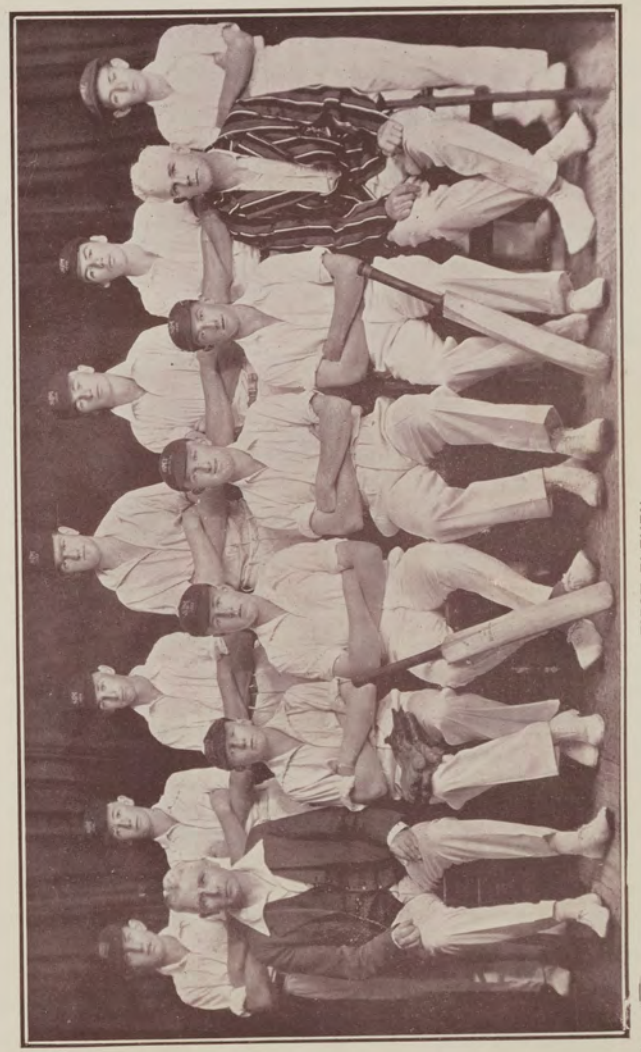
TREASURE-TROVE.

"This little book fed me in a very hungry place," says Mark Twain's "Tramp Abroad," and he speaks truth, for books feed the mind as surely as food nourishes the body. Reading then, should be as simple and natural a part of everyday life as eating and drinking. But is it? Most of us have a lurking suspicion that reading is study, study means work, and work—well! we think we always have plenty of that!—and so our reading suffers, and we are the poorer for it.

We all admire the people who achieve things, and that perhaps makes us impatient of reading when we feel we might be doing. We would belong to the men of action, not the dreamers. Yet such men generally attained greatness simply by fulfilling their dreams, and it is reading, with the thought that it provokes, that clears our ideas for us, gives us our hopes and our dreams. Abraham Lincoln fashioned the fabric of America from the yarn of his youthful musings, and Raleigh, coloniser, courtier and historian, found in literature, greater wealth than that of fabled El Dorado.

Books will yield up their treasure only to those who come seeking for gold, much as flowers open to the sun. Your library puts these riches before you. It offers you the wisdom of the greater ones of the past and of your own time, and brings you the "tales that hold children from play and old men from the chimney corner." The books are your books and hold gifts for every one of you. You may feel you hardly know what good things to seek, but you have only to set out on the search to find that the rich ore crops out everywhere—and the deeper one delves, the richer the yield.

—D.O.H.



FIRST ELEVEN.

Front Row: Mr. Burley, Sutherland, Thompson, Flyger (capt.), Wakefield, Mr. Taylor.
Back Row: Russell, Lund, Stonestreet, Nolan, Glass, Burton, Graham.

Summer Sports

CRICKET, SWIMMING
ATHLETICS

CRICKET NOTES.

FIRST ELEVEN.

Members of the team: Wakefield (captain), Thompson, Burton, Castles, Stonestreet, Abbott, Paton, Brady, Lund, Clark, Kent, Broberg.

Flyger, last year's captain and member of the First XI for several years, returned to school but found a position after the commencement of the first match. With the mainstay of the team gone we were left very weak and our prospects were not bright.

Versus Auckland Grammar.

Our first match was against Auckland Grammar. Technical, winning the toss, elected to bat and Flyger and Thompson met the bowling with confidence. With the score at 24, Thompson in stepping back to pull a ball to leg stood on his wicket. Wickets now fell cheaply six being down for 47. Luckily the tail wagged and 74 more runs were put on the board before the innings closed at 121.

Auckland Grammar took their turn at the crease to the bowling of Wakefield and Thompson. The opening batsmen put on 39 runs. Then Blackie made a determined stand with the assistance of Hunt, Hollies and Munro. The innings closed at 175, which total could have been greatly reduced if the Technical fielding had been at all keen.

With an hour and a half left Technical batted and put on 58 runs for four wickets. Scores:—

TECHNICAL—First Innings.

Flyger, b. Ricketts	25
Thompson, hit wicket, b. Munro	7
Lund, c. and b. Ricketts	0
Wakefield, b. Ricketts	3
Burton, c. and b. Childs	11
Castles, l.b.w., b. Hollies	3
Stonestreet, b. Childs	1
Abbott, c. and b. Martin	20
Brady, not out	15
Clark, c. and b. Hamilton	22
Wadey, st. Pattison, b. Hollies	5
Extras	9
Total	121

Bowling.—Childs, two for 34; Hollies, two for 26; Munro, one for 10; Ricketts, three for 18.

AUCKLAND GRAMMAR.—First Innings.

Pattison, l.b.w., b. Flyger	24
Richards, c. Thompson b. Wakefield	15
Martin, b. Wakefield	1
Childs, b. Flyger	0
Blackie, c. Thompson, b. Stonestreet	53
Hollies, b. Wakefield	17
Munro, c. Abbott, b. Clarke	15

Hunt, run out	23
Ricketts, b. Thompson	0
Awhitu, b. Wakefield	3
Hamilton not out	6
Extras	18
Total	175

Bowling.—Wakefield, four for 49; Flyger, two for 24; Thompson, one for 31; Clarke, one for 27.

TECHNICAL—Second Innings.

Flyger, c. Martin, b. Munro	20
Thompson, l.b.w., b. Munro	4
Burton, b. Munro	2
Wakefield, not out	23
Lund, run out	3
Castles, not out	5
Extras	1
Total for four wickets	58

Versus Sacred Heart.

Wakefield, winning the toss, took first strike. Our batsmen, with the exception of Castles and Wakefield, failed, although the bowling was not very difficult.

Sacred Heart replied with a score of 169, due to dropped catches and poor fielding. This finished this match as it was a one day match. Scores:—

TECHNICAL.

Thompson, b. Coupe	6
Burton, b. Coupe	1
Paton, b. Kawe	0
Wakefield, b. Coupe	18
Castles, c. Coupe, b. Hare	21
Abbott, c. Coupe, b. Hare	4
Stonestreet, l.b.w., b. Coupe	3
Brady, c. E. Coupe, b. Coupe	0
Clark, c. E. Coupe, b. Clancy	13
Broberg, not out	0
Kent, c. Coupe, b. Clancy	9
Total	75

Bowling.—C. Coupe, five for 35; Hare, two for 18; Clancy two for 0.

SACRED HEART

O'Donoghue, c. Brady, b. Thompson	28
Clancy, b. Wakefield	4
Hare, l.b.w., b. Wakefield	48
Schollum, b. Clark	12
C. Coupe, b. Thompson	8
Kawe, b. Paton	24
Butler, b. Thompson	4
McHugh, b. Thompson	6
Wordsworth, c. Stonestreet, b. Castles	3
O'Sullivan, b. Stonestreet	15
E. Coupe, not out	0
Extras	17
Total	169

Bowling.—Thompson, four for 37; Wakefield, two for 48; Clark, one for 12; Paton, one for 17.

We commenced a game against Takapuna Grammar School, but owing to the inability to finish the match it was cancelled until next term which was fortunate for us, as Takapuna had scored 252 for four wickets (declared) and Technical were three down for 57.

Again in this match the fielding was "awful." Even though the team is young and inexperienced, one of the first qualifications of any cricket player should be that of being able to stop a ball.

Our coach, Mr. Taylor, although very disappointed with the fielding in general, stuck loyally to his task of trying to make a team out of the material he had available, and it is to be hoped that the boys will take the game more seriously next season.

Secondary School Representatives.

The annual match against the North Shore Senior Eleven was played at North Shore on Easter Monday. The North Shore team was too strong for the schoolboys and gained an out-right win. North Shore in their first innings made 250, and in their second innings compiled 140. The Reps. made 35 and 107.

The Secondary School team was.—Munro (capt.), Pattison (A.G.S.), Wakefield (S.M.T.C.), Martin, Rowntree (M.A.G.S.), Coupe, Hare (S.H.C.), McGruther, Norris (King's), Stevenson, West (T.G.S.).

SECOND ELEVEN.

Owing to various interruptions, only two matches were played in the first term. Both of these created intense interest because of the closeness of the scores, even though the standard of cricket on both sides was not as high as it has been in other years.

In the first match, against Auckland Grammar School, Technical compiled 109 in the first innings, due mainly to a bright innings of 66 by Paton, which included eight fours. Hitchings (11) was the only other double figure score. A sixth-wicket stand of 39 by the two above-named enabled a respectable total to be reached. At the end of the first day Auckland Grammar had put on 25 for one wicket. On the second day Hitchings clean bowled one opening bat, and with Paton bowling splendidly at the other end, Grammar had to play very carefully. A dogged innings by Arkenstall (44), saved them, however, although at the end of the first hour only 18 runs had been scored for the loss of five wickets. The last man came in with 13 runs to make. After several narrow escapes, the last pair just passed the Technical total, and the innings closed for 118. Hitchings had bowled very consistently, getting five wickets for 43 and Paton two for 41. In our second innings we lost two wickets for 30 runs. Some indication of the dogged nature of the play can be seen by the time taken to complete an innings each. The fielding on both sides was very keen indeed and few chances were lost.

The second match, against Mt. Albert Grammar, was remarkable for low scoring on both sides. Technical, opening on a soft wicket, were very soon in trouble to accurate bowling and very brisk fielding. The wickets fell at 6, 12, 19, 19, 21, 22, 22, 25 (the last man being absent). Harris made top score with seven to his credit, and no fewer than five men made "ducks." Lighthearted at their success, Mt. Albert opened briskly to the fast and accurate bowling of Woolley and Pearson. In their second over, however, two men were bowled, and then the position became much the same as in Technical's first effort, and wickets fell at 1, 1, 2, 8, 9, 13, 26, 26, seven making "ducks." Even with this low score there were one or two catches missed in the field, though the fielding was quite fair. Pearson bowled a very good length and ended up with five wickets for seven runs. Woolley took two for nine, and Hitchings one for four. The excitement was intense as Mt. Albert passed the Technical total with four wickets in hand, only to see them all fall at 26.

Both innings had occupied only an hour each and it looked as if the game might be over in one morning, particularly when Emus and Harris were both out at a total of three runs, but Lund (18) and then Malyon (28) and McLean (37) put up a fine stand. At the end of the first day's play, the last two were still in, and the total four for 72. The next day the total was raised to 139. Bundock played a gallant innings for 19, in spite of hefty fieldsmen crowding all round him at first.

This left Mt. Albert with 139 to make to win, and when four wickets were down for 31, the batsmen sought to hold up their wickets so as to claim a win on the first innings. But accurate bowling and good fielding enabled Technical to win with three minutes only to go, the last man being run out after "blocking" carefully for ten minutes. As the total was 81, Technical won by 57 runs. Pearson took five wickets for 23 and Woolley, Hitchings and Harris also bowled well.

Both matches were played in a keen but friendly spirit, and both ended in an exciting manner to say the least. The match against King's College had to be postponed till the third term. Unfortunately, by that time we will have lost some of our players to the first XI which always seems to need replenishing from our ranks. Team: Hitchings (capt.), Broberg, Harris, Paton, Malyon, McLean, Jones, Bundock, Woolley, Pearson, Emus, Kent, Clist.

THIRD ELEVEN.

Recruiting some very useful members from the ranks of the first years, this year's third eleven is a promising team. Out of four matches played, two have been lost and two won, and in every case our opponents appeared to be much older boys than those in our team.

The loss of Woolley to the Second Eleven weakened our attack greatly, but Rae and Blythen, the only two reliable bowlers left in the team, managed to keep our opponents' scores down.

Our most successful batsmen were B. Bently, with an unusual hook shot that produced many runs; Rae, a good orthodox player; Skeen, who has some pretty off strokes; and Blythen, who as an opening batsman keeps his end up well.

The fielding was, on the whole, good, but our great weakness was the lack of a good wicket-keeper. Games played:—

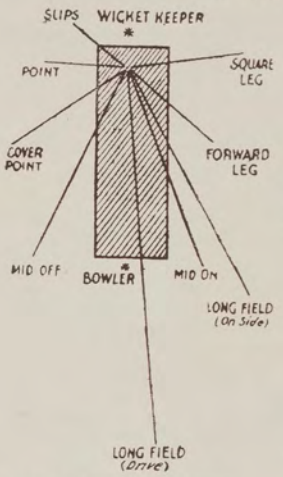
Versus Takapuna, won 113 to 30 and 45; Versus Grammar B, won 57 to 34; Versus Grammar A, lost 72 to 109; Versus Mt. Albert B, lost 58 to 85.

Team: McAneany (capt.), Blythen (vice-capt.), Rae, B. Bentley, S. Bentley, Otter, Jensen, Randrup, Skeen, Edgar, Bain, Wallace, Harvey.

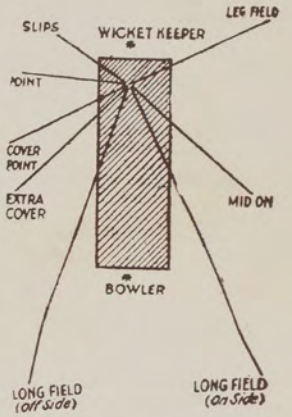
FOURTH ELEVEN.

The fourth eleven was highly successful during the first term, winning all of its matches. Some very keen games were played, the most exciting being that against Grammar A, which team almost succeeded in playing out time for a draw. Greatly to our joy the last wicket fell to the last ball of the last over. Could anything be more thrilling than that? This match was noteworthy from our point of view for several reasons. Firstly, the 4th XI made its highest innings total for the season, viz., 129; secondly, Patterson compiled an excellent 56 runs, and finally Cox, bowling a la Larwood, took seven

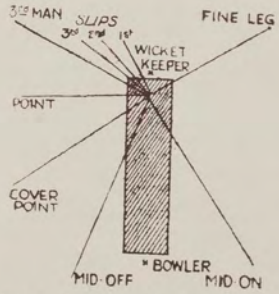
HOW FIELD IS PLACED.



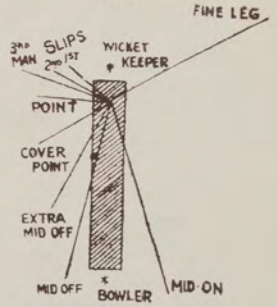
The field set for slow bowler.



The field set for medium-slow-paced bowler.



The field set for fast bowler off-theory.



The field set for fast-medium bowler.

These diagrams showing the placing of the field for different types of bowlers, were prepared by Mr. Don Blackie, the famous Victorian slow bowler.

—By courtesy of "Auckland Star."

wickets for 21 runs. In fact Cox proved to be the best bowler in all matches and in the above-mentioned game also distinguished himself by taking the coveted hat trick. Of the sixteen overs he sent down, ten were maidens.

Altogether the team under the captaincy of Fry, gave a very promising display and showed distinct improvement as the season progressed. Record of results:—

Versus Technical B.....won on first innings.
Versus Scared Heart.....won on first innings.
Versus Dilworth.....won by default.
Versus Grammar A.....won on first innings.

Team: Fry (captain), Patterson, Cox, O'Meara, Healy, Rattray, Naughton, Kinney, Bruning, Montague, Hayter, Farrow.

FIFTH ELEVEN.

The Fifth Eleven lost rather heavily to the Fourth Eleven in the first match of the season scoring 52 against 110.

The second game should have been an easy win but provided instead another example of the uncertainty of cricket. Kowhai was dismissed for 54 and S.M.T.C. were six wickets down for 53. The last four players failed to add to the score, Kowhai winnng by one run.

The match against Sacred Heart was lost by 48 to 76. Sacred Heart were 9 down for 52 but the last wicket proved stubborn.

The final match was that against Dilworth and both sides had two innings. Dilworth scored 61 and 56 against 24 and 61 by S.M.T.C.

In each match the fielding of the team was good, many smart catches being taken. In batting Mitchell and Fry were most consistent, while Mitchell, Hayter and Ord were the most successful bowlers.

The team was: Fry, Campling, Mitchell, Hayter, Coulter, Annan, Bolton, Blair, Ord, Thompson and Smith.

SIXTH ELEVEN.

The Sixth Eleven began the season with a very promising team but we were unfortunate in losing several of our best players, including Flaxman, our captain and a solid support both as bowler and batsman. Nevertheless, we were able to win three out of the four matches played and every member keenly enjoyed the privilege of being able to meet other secondary school teams. Those who gained us most wickets were Flaxman, Hardman and Bancroft, while in batting, Bancroft, Kinney and de Maus were most reliable. The excellent wicket-keeping of Kinney should be especially mentioned.

Summary of games played:—

Versus Takapuna Grammar School .... won by an innings
Versus Technical B. ..... won on first innings
Versus Mt. Albert Grammar School .. lost on first innings
Versus Sacred Heart ..... won on first innings

SEVENTH ELEVEN.

At the commencement of the season the hopes of the Seventh XI were high for, as well as several of last year's players, we had a number of promising first year players. Most of these, however, were confiscated by higher teams. Our batting at first proved to be our stronger department but, as the season advanced, our bowling improved to the detriment of the former.

The team consisted of the following players: Wells (capt.), Baird (vice-capt.), Burgess, Murray, Sargent, Heaton, Evans, Olsen, Duncan, Mitchell, Curry, Smith.

The results of the matches played were: 107 versus Sacred Heart College 157; 51 versus Northcote 159; 45 versus Seddon Memorial Technical College A 63; 46 versus Takapuna Grammar School 84.

AUCKLAND'S NEW CRICKET COACH.

Leslie Fletcher Townsend, the Derbyshire County professional cricketer, is 31 years of age. He has proved himself a strong all-rounder. He is well equipped as a batsman, and has a great variety of strokes. He is especially good in front of the wicket, his off drives being as a rule well timed and placed, and when set he is a difficult man to dismiss. He can play vigorous cricket if necessary, and in this way can turn the course of a match. He has been equally successful as a bowler. He is a very good medium-paced, right-hand bowler. He breaks the ball from the off, and with a nice easy action, imparts the necessary spin to make it come quickly off the pitch. He is also a first-class field.

Townsend first played for Derbyshire in 1922 at the age of 19, but it was not until 1927 that he really came to the front as a first-class cricketer. In this year he was not very successful as a batsman, but achieved success as a bowler, taking 66 wickets at an average of 18.27. In this year he was selected for the North v. South match at Sheffield.

In 1928 he finished the season with a batting average of 30, and his bowling was 87 wickets at an average of 23.79. One of his successes was 13 Sussex wickets for 111 runs. Against Lancashire he made 90 not out, by clean, hard driving. Other successes were 55 not out, out of 86, v. Sussex, and 98, v. Gloucestershire.

In the following year he fell off a little in his batting, but improved as a bowler, taking 91 wickets at an average of 19.

In 1930 Townsend began to show improvement as a batsman, and made 1234 runs for the season. In this total were four centuries, including 104 v. Kent, 141 v. Middlesex, and 117 v. Warwickshire. He also made 81 not, v. Surrey.

The next season Townsend scored 1350 runs and took 104 wickets. His highest score was 153 not out v. Middlesex. He also headed the Derbyshire bowling average.

Last season, 1933, brought Townsend right to the front. He scored well over 2000 runs for the season, and took 87 wickets at a cost of 16.91. His batting total included six centuries, his highest score being 233. Owing to his excellent performances he found a place in Wisden's 1934 "Five Cricketers" of the year, the other four being, A. H. Bakewell, C. F. Walters, M. S. Nichols, and C. A. Headley, of West Indies.

For some years past past Townsend has been included in the Gentlemen v. Players matches at Lords. He was a member of the Hon. F. S. C. Calthorpe's Eleven to tour West Indies in 1929-30, and was a member of Jardine's team to India this year. In the latter tour he made 829 runs and took 65 wickets at an average of 14.33 runs. He is described by Wisden as an admirable type of the present day professional.

He has been recommended to the Auckland Cricket Association as a coach, by both Lord Hawke and Mr. P. F. Warner.

A MERITORIOUS PERFORMANCE.

At the Canadian Schools' Athletic Championships, held in British Columbia, Milton Parsons, of the Vancouver Technical School, covered himself with glory in winning three Dominion titles: High jump, 5ft. 8¾in.; pole vault, 10ft. 9½in.; 120 yards hurdles, 17 3-10 seconds.

SWIMMING

As usual the boys' and the girls' swimming carnival were held separately at the Shelly Beach Baths, the girls on Tuesday, 27th February, and the boys on the following day. In each case the competitors were favoured with fine weather and a lengthly programme was expeditiously carried through.

GIRLS' EVENTS.

The champion house proved to be Binns with a tally of 61½ points, the next house being Hindley with 49½ points, while Seddon and Wellesley were a long way behind with 29 and 27 points respectively. The Senior Championship was secured by P. Johnson (H), a notable young swimmer, with A. Pallister (B) runner-up, while J. Baird (W) and M. Maguire (B) occupied a similar position in the Junior Section.

Junior Championship.—J. Baird (W) 6, M. Maguire (B) 4.

Senior Championship.—P. Johnson (H)8, A. Pallister (B) 6.

House Points.—Binns 61½, Hindley 49½, Seddon 29, Wellesley 27.

Junior Championship:33 1-3 yds. on back.—D. Ryan (B) 1, J. Haggett (S) 2, F. McRae (H) 3.

Senior Championship, 50 yds. on back.—P. Johnson (H) 1, A. A. Pallister (B) 3.

Plunge Race, 50 yds.—P. Johnson (H) 1, D. Pilgrim (W) 2, Pallister (B) 2.

Neat Jump.—J. Prescott (H) 1, R. Norrie (H) 2, B. Watson (H) 3.

Junior Championship 33 1-3 yds. Breast Stroke.—J. Baird (W) 1, M. Maguire (B) 2, D. Wilson (S) 3.

Senior Championship, 50 yds. Breast Stroke.—A. Pallister (B) 1, P. Johnson (H) 2, M. Mullins (W) 3.

Junior Championship, Overarm, 33 1-3 yds.—J. Baird (W.) 1, M. Maguire (B) 2, J. Haggett (S) 3.

Senior Championship, Overarm, 66 2-3 yds.—P. Johnson (H) 1, J. Henderson (S), 2, A. Pallister (B) 3.

Umbrella Race.—S. Black (S) 1, N. Moore (B) 2, J. Wainwright (B), 3.

Neat Dive.—A. Pallister (H) 1, P. Johnson (H) 2, D. Pilgrim (W) 3.

33 1-2 yds. Open: Final.—J. Lynch (B) 1, M. Glassey (S) 2, B. McGrane (H) 3.

Longest Plunge.—A. Pallister (B) 1, J. Wainwright (B) 2, P. Bowkett (W) 3.

Junior House Relay:—Seddon 1, Binns 2, Wellesley 3.

Senior House Relay:—Hindley 1, Wellesley 2, Seddon 3.

Novice Race.—N. McDonald (B) 1, J. McDonald (B) 2, A. Irvine (W) 3.

Life Saving House Event.—Binns 1, Hindley 2, Wellesley 3.

Form Relay.—Commercial 3B, 1, Domestic 3 and 4 2.

Dressing Race:—S. Knight (H) 1, D. Pilgrim (W) 2, B. McGrane (H) 3.

100yds. Open: any Stroke.—P. Johnson (H) 1, A. Pallister (B) 2, M. Wright (H) 3.

Age Race, under 13, 25 yds.—E. Taylor (S) 1, S. Lyons (B) 2, J. Stewart (B).

Age Race, under 14, 25 yds.—M. Glassey (S) 1, N. Moore (B) 2, L. Mattocks (B) 3.

Age Race, under 15. 33 1-3 yds.—J. Lynch (B) 1, S. Knight (H) 2, A. Cosslett (B) 3.

Age Race, over 15—P. Johnson (H) 1, A. Pallister (B) 2, D. Pilgrim (W) 3.

BOYS' COMPETITIONS.

The outstanding competitor among the boys was Pascoe (W), who had established a great reputation in junior swimming before entering the College. Although a junior, he easily won the senior championship, returning record times in almost all events. It was unfortunate that, through a misunderstanding, he swam 280 yards in the Senior 220 yards Championship but, later in the day he returned the excellent time of 2 mins. 52 secs. in the 220 open handicap.

Amongst the juniors Naughton (B) did well to defeat Mitchell (H) last year's junior champion. Naughton showed himself to be a much improved swimmer and his record time of 29 2-5 secs. for the 50 yards is likely to stand for a long time. In fact his time in this race was 3-5 secs. better than that of Pascoe in the senior event.

Thanks to Pascoe's help Wellesley House secured the house championship with 58 points, closely followed by Hindley 51½ points, Seddon 40½, and Binns 35, brought up the rear.

Senior Championship.

220 Yards.—Pascoe (W) 1, Aikman (H) 2, Ritchie (S) 3; time 3m 54 1-5s for 280yds.

Neat Header.—Aikman (H) 1, Pascoe (W) 2, Anderson (B) 3.

50 Yards Backstroke.—Pascoe (W) 1, Aikman (H) 2, M. Mason (H) 3; time 39s (record).

50 Yards Breaststroke.—Scadden (S) 1, Ritchie (S) 2, Aikman (H) 3; time 51s.

Plunge Dive.—Pascoe (W) 1, Aikman (H) 2, Crowhurst (S) 3; distance 42ft 2½ins.

440 Yards.—Pascoe (W) 1, Aikman (H) 2, M. Mason (H) 3; time 5m 56 2-3s.

50 Yards.—Pascoe (W) 1, Aikman (H) 2, Ritchie (S) 3; time 30s (record).

Total Points.—Pascoe 28 (1), Aikman 21 (2), Ritchie 6 (3), Scadden 5, Mason 2, Anderson 1, Crowhurst 1.

Junior Championship.

220 Yards.—Naughton (B) 1, Russell (W) 2, Mitchell (H) 3; time 3 m 11 2-5s.

Neat Header.—Mitchell (H) 1, Naughton (B) 2, Russell (W) 3.

50 Yards Breaststroke.—Naughton (B) 1, Mitchell (H) 2, Russell (W) 3; time 43 4-5s.

Plunge Dive.—Russell (W) 1, Mitchell (H) 2, Naughton (B) 3; distance 42ft. 4½ins.

50 Yards.—Naughton (B) 1, Mitchell (H) 2, Russell (W) 3; time 29 2-5s (record).

Total points.—Naughton 19 (1), Mitchell 14 (2), Russell 12 (3).

Relay Race (1st Year Forms).—Engineering 1E 1, Engineering 1C and 1D 2, Accountancy 1B 3.

Relay Race (2nd Year Forms).—Engineering 2B 1, Accountancy 2A 2, Motor Engineering 2 3.

Relay Race (3rd and 4th Year Forms).—Engineering 4 1, Accountancy 3 2, Engineering 3A 3.

Relay Race (Junior House Teams).—Seddon 1, Binns 2, Wellesley 3.

Relay Race (Senior House Teams).—Seddon 1, Hindley 2, Wellesley 3.

220 Yards Open Handicap.—Pascoe (W) 1, Nelson (B) 2, Pearson (H) 3; time 2m 52s (record).

440 Yards Handicap.—Pascoe (W) 1, Cassrells (B) 2, Mason (H) 3.

50 Yards Breaststroke Handicap.—Scadden (S) 1, Wells (H) 2.

Egg and Spoon.—Golding (S) 1, Turvey (B) 2, Furness (B) 3.

The girls' swimming sports, 1934. —By courtesy of "Auckland Star."

50 Yards Handicap (under 16).—Sutton (H) 1, McInnarney (S) 2, Hutchings (H) 3; time 33 4-5s.

50 Yards Handicap (under 15).—Jones (W) 1, Nunns (W) 2, Chappell (S) 3.

50 Yards Handicap (under 14).—Rickman (W) 1, Lynne (W) 2, Veart (H) 3.

50 Yards Handicap (under 13).—Selwyn (W) 1, Leigh (H) 2, Lord (W) 3.

50 Yards Handicap (open).—Aikman (H) 1, O'Dowd (W) 2, Lowther (S) 3.

100 Yards Handicap.—O'Dowd (W) 1, Rickman (W) 2, Cassrells (B) 3.

Learners Race.—Pooch (S) 1, Yates (H) 2, Goodall (B) 3.

Plunge Dive (Open Handicap).—Sly (S) 1, Collings (H) 2, Langon (H) 3; distance 38ft. 6½ins. nett.

Corfu Dive.—Rawnsley (B) 1, Boswell (W) 2, McInnarney (S) 3.

Neat Header (Open).—McLean (B) 1, Mitchell (H) 2, McCowatt (S) 3.

Plate Dive.—Clark (B) 1, McRae (S) 2, Darroch (H) 3.

A WORLD MILE RECORD FOR SCHOOLBOYS.

At the annual sports of the Timaru Boys' High School, V. P. Boot ran the mile in the remarkable time of 4min 26 4-5 sec—a world record. He also established a New Zealand record by running the 880 yards in 2min.

The high jump record at the Kelvin Technical High School, Winnipeg, Canada, is 5ft. 10⅞in.!

A SPORTS WRITE-UP.

Our Canadian cousins at the Nova Scotia Technical College certainly put pep into their write-up of games.

"This game was a slam-bang affair. From the first whistle to the last no one knew whether it was hockey or water polo. As hockey goes it would have been a great game of puss-in-the-corner, with lots of earthquakes for good measure.

Tech. scored four goals in the first period, and their final goal in the second. The All Stars scored the first two in the second canto and four in the final chucker. To say that the Tech. squad had sore bottoms was putting it mildly. Their skates would have been more useful on another part of their anatomy. These human mops went to their dressing room a sad and wet-looking outfit. Any wise-cracking genius who had dared to say that Tech. was all wet would have got a sock on the chin. And so the steaming, thundering herd packed up their anatomies and sailed for home."

N.B.—You will probably have guessed that the game is ice-hockey.

The boys at Vancouver Technical School now greet their masters with a special sign given in this manner. The left elbow is bent, allowing the forearm to come to the front and lie parallel to the ground. At the same time the fist is closed, knuckles to the left, thumb upraised in a vertical position. On this sign being repeated by the friend greeted, the arm is cut smartly to the side. Thus is a Tech. boy known.

ATHLETICS

BOYS' AND GIRLS' ANNUAL SPORTS.

The annual Athletic Sports were scheduled for Tuesday 27th March, but, owing to bad weather, the meeting had to be postponed until the following day. Actually, a start was made on the Tuesday, but, greatly to the delight of the boys and girls, the pupils were sent home after ten o'clock. Although showery weather was experienced next day a lengthy programme was expeditiously carried through.

In the boys' section an innovation this year was the introduction of an intermediate championship in order to bring our athletics into line with the Inter-Secondary Schools meeting.

Records broken were.—Throwing the Cricket Ball, Wakefield 284 ft.. 1 in; Senior Long Jump, Wakefield 20 ft. 4 ins; Junior Half Mile, Clarke, 2 mins. 21 4-5 secs.

The points for the boy's championship were:—

Senior: Wakefield 30, Wilshere 14, Galloway 12.
Intermediate: Jensen 22 1-3, Stevenson 12, Rawnsley 11 1-3.
Junior: Clark 18, Herring 13, Morrison 9.

In the girls' championship the honours were taken by:—

Senior: R. Tilby (H) 10, M. Mullins (W) 7.
Junior: V. Faulkner, (H) 11½, A. Catchpole (S) 7½.

The House competition resulted in a win for Seddon on the boys' side and Hindley on the girls.

House Points.

Boys: Seddon 164, Binns 117 5-6, Wellesley 112, Hindley 110 1-6.
Girls: Hindley 116½, Binns 84, Wellesley 67½, Seddon 41.

BOYS' EVENTS.

Long Jump Junior Championship.—Clarke 1, Woolley 2, Manning 3. Distance, 14ft 10in.

High Jump Handicap, under 16.—Waldron 1, Pearson and Anderson (equal) 2. Height 4ft 7¾ in.

High Jump, Intermediate Championship.—Findlay and Stevenson (equal) 1, Rawnsley, Jensen and Thorpe (equal) 3.

High Jump, Senior Championship.—Farrand 1, Darroch 2, Galloway 3. Height, 4ft 9in.

220 Yards Senior Championship.—Wakefield 1, Wilshere 2, Galloway 3. Time 24 4-5s.

880 Yards Intermediate Championship.—Tweedie 1, Jensen 2, Thorpe 3. Time 2.27 4-5s.

880 Yards Junior Championship.—Clarke 1, Herring 2, Manning 3. Time 2.21 4-5—a record.

One Mile Senior Championship.—Tweedie 1, Galloway 2, Wilshere 3. Time 5.17 2.5s.

100 Yards Intermediate Championship.—Jensen 1, Stevenson and Thorpe (dead heat) 2. Time 12s.

Long Jump Handicap, over 16.—Robinson 1, Fray 2, McAndrews 3. Distance 18ft. 11½in.

Long Jump Handicap, under 16.—Harrison 1, Sutton 2, Waldron 3. Distance, 16ft 4in.

880 yards Handicap, over 16.—O'Dowd 1, Emus 2, Mason 3. Time, 2.13 3-5s.

100 Yards Junior Championship.—Morrison 1, Covey 2, Basset 3. Time, 11 3-5s.

100 Yards Handicap, under 13.—McLean 1, Swanberg 2, Lord 3. Time, 12 4-5s.

100 Yards Handicap, under 16.—Broberg 1,, Emus 2, Castle 3. Time 11 1-5s.

Discus Throw.—Robinson 1, George 2, Pearson 3. Distance, 81ft 9in.

220 Yards Junior Championship.—Herring 1, Bassett 2, Morrison 3. Time, 27 3-5s.

220 Yards Intermediate Championship.—Jensen 1, Thorpe 2, Stevenson 3. Time, 26 3-5s.

440 Yards Handicap, under 15.—Andrews 1, Stanley 2, James 3. Time 62 2-5s.

440 Yards Handicap, under 16.—Emus 1, Smith 2, Sutton 3. Time, 58 2-5s.

440 Yards Handicap, over 16.—George 1, Breen 2, Allen 3. Time, 61 4-5s.

One Mile Open Cycle Championship.—McInnarney 1, Chappell 2 Stacey 3. Time 3m, 13 1-5s.

100 Yards Senior Championship.—Wakefield 1, Wilshere 2, Galloway 3. Time 10 3-5s.

100 Yards Handicap, under 14.—Bruning 1, Impey 2, Smith and Skeen (dead heat) 3. Time, 11 1-5s.

Putting the Shot.—Borich 1, O'Dowd 2, Robinson 3. Distance, 34ft 1¾in.

100 Yards Handicap, under 15.—Harrison 1, Platt 2, Pearce and Longbottom (dead heat) 3. Time 11 3-5s.

Hop, Step and Jump, open handicap.—Wilshire 1, Robinson 2, Darroch 3. Distance, 39ft 7¾in.

220 Yards Handicap, under 15.—Billings 1, McLean 2, Cope 3. Time, 28 2-5s.

220 Yards Handicap, under 16.—Emus 1, Box 2, Ozich 3. Time 26s.

220 Yards Handicap, over 16.—Fry 1, George 2, Breen 3. Time 26 4-5s.

440 Yards Senior Championship.—Wakefield 1, Galloway 2, Wilshere 3, Time 56 2-5s.

440 Yards Intermediate Championship.—Jensen 1, Rawnsley 2, Tweedie 3. Time 62 4-5s.

440 Yards Junior Championship.— Herring 1, Clark 2, Bassett 3. Time, 62 2-5s.

Junior Tug-of-War.—Seddon 1, Wellesley 2, Hindley 3.

Intermediate Tug-of-War.—Hindley 1, Binns 2, Seddon 3.

Senior Tug-of-War.— Seddon 1, Binns 2, Wellesley 3.

120 Yards Hurdles Senior Championship.—Wakefield 1, Galloway 2. Farrand 3. Time, 20 2-5s.

100 Yards Handicap, over 16.—Robinson 1, Borich 2, George 3. Time, 11 1-5s.

Long Jump Intermediate Championship.—Rawnsley 1, Jensen 2, Kennerley 3. Distance, 16ft.

Long Jump Senior Championship.—Wakefield 1, Wilshire 2, Farrand 3. Distance, 20ft 4in—a record.

One Mile Open Handicap.—Tweedie 1, O'Dowd 2, Cathcart 3 Time 5.1 1-5s.

Two Miles Open Cycle Championship.—McInnarney 1, Stacey 2, Chappell 3. Time 5.58 1-5s.

High Jump Junior Championship.—Clark 1, Morrison 2, Jones. Bassett and Nicolson 3. Height, 4ft 3¼in.

880 Yards Senior Championship.—Wakefield 1, Wilshere 2, Tweedie 3. Time 2.16 4-5s.

One Mile Cycle Handicap.—McInnarney 1, Stacey 2, Chappell 3. Time, 2.45s.

120 Yards Open Hurdles Handicap.—Borich 1, Robinson 2, George 3. Time 19s

99 Yards Hurdles Intermediate Championship.—Stevenson 1, Rawnsley 2, Jensen 3. Time 14 3-5s.

High Jump Handicap, over 16.—Turnbull and Duncan (equal) 1, Robinson 3. Height, 4ft 9in.

440 Yards Junior House Relay.— Seddon 1, Hindley 2. Binns 3. Time, 56 2-5s.

880 Yards Intermediate House Relay.—Seddon 1, Hindley 2. Wellesley 3. Time 1.58.

880 Yards Senior House Relay.—Binns 1, Wellesley 2, Seddon 3. Time 1.55.

Throwing Cricket Ball.—Wakefield 1, Lord 2, Wills 3. Distance, 284ft 1in—a record.

GIRLS' EVENTS.

Circular Ball, junior.—House Event: Wellesley 1. Hindley 2, Binns 3.

Balance Walk, 50yds.—J. Gavar (B.) 1, C. O'Sullivan (W.) 2, M. James (W.) 3

Bean Bags, junior.—House event: Hindley 1, Binns 2, Wellesley 3.

Walking Race, 220yds.—Junior Championship: E. Hutchinson (B.) and J. Haggett (S.) (dead-heat) 1.

Flat Race, 220yds.—Senior Championship: M. Mullins (W.) 1, R. Tilby (H.) 2, C. Le Long (W.) 3.

Hop, Step and Jump.—Senior Championship: S. Knight (H.) 1, D. Pilgrim (W.) 2, C. Cantlay (S.) 3. Distance 29ft 7in.

Hop, Step and Jump.— Junior championship: V. Faulkner (H.) 1, E. McKenzie (B.) 2, A. Catchpole (S.) 3. Distance 30ft 9in.

Skipping Race, 75yds.—Junior: B. Collins (H.) 1, J. Bright (B.) 2, E. McKenzie (B.) 3.

Potato Race.—J. Rogers (W.) 1, R. Miller (S.) 2, D. Lloyd (B.) 3.

Flat Race, 220yds.—Junior Championship: V. Faulkner (H.) 1, O. Catchpole (S.) 2, E. McKenzie (B.) 3.

Flag Relay, junior.—House event: Binns 1, Wellesley 2.

Bean Bags, senior.—House event: Binns 1, Seddon 2, Hindley 3.

Skipping Race, 75yds.—Senior Championship: R. Tilby (H.) 1, M. Mullins (W.) 2, S. Knight (H.) 3.

440 Yards Relay, senior.—House event: Hindley 1, Wellesley 2, Binns 3.

Sack Race, 50yds.—J. McGarry (B.) 1, J. Gilchrist (H.) 2, F. MacCrae (H.) 3.

Skipping Race, 75yds.—Junior Championship: V. Faulkner (H.) and A. Catchpole (S.) (dead heat) 1, J. Sullivan (H.) 3.

Flat Race, 75yds.—Open: M. Mullins (W.) 1, V. Faulkner (H.) 2, S. Knight (H.) 3.

Flat Race, 75yds.—Under 15: E. Lewis (B) 1, S. Knight (H.) 2, K. Goddard (H.) 3.

Flat Race, 75yds.—Under 14: B. Collins (H.) 1, E. MacKenzie (B.) 2, M. Glassey (S.) 3.

Flat Race, 75yds.—Under 13: M. Henley (W.) 1, F. Flaxman (B.) 2, J. Gisby (H.) 3.

Overhead Ball, senior.—House event: Seddon 1, Hindley 2, Binns 3.

Flat Race, 100yds.—Junior Championship.—V. Faulkner (H) 1, A. Catchpole (S.) 2, M. Glassey (S.) 3.

Flat Race, 100yds.—Senior championship: R. Tilby (H.) 1, M. Mullins (W.) 2, S. Knight (H.) 3.

Stilt Race, 50yds.—E. Alexander (S.) 1, R. Corbett (H.) 2, J. Vear (H.) 3.

Overhead Ball, Junior.—House event: Binns 1, Seddon 2, Hindley 3.

Skipping Race, 75yds.—Senior: M.Mullins (W.) 1, B. McGrane (H.) 2, S. Knight (H.) 3.

Circular Ball, senior.—House event: Binns 1, Hindley 2, Seddon 3.

440 Yards Relay, junior.—House event: Hindley 1, Binns 2, Wellesley 3.

Flat Race 100 yds.—Senior: M. Williams (W) 1, B. McGrane (H) 2, K. Goddard 3.

Flat Race, 100 yds.—Junior: B. Collins (H.) 1, A. Catchpole (S.) and N. Ashby (W.) (dead-heat) 2.

Flag Relay, senior.—House event: Hindley 1, Wellesley 2, Binns 3.

Form Relay.—C3B 1, D.IE and F 2, D3 and 4 3.

Quoits.—Senior: C. Le Long (W.) 1, R. Tilby (H.) 2, J. Prescott (H.) 3. Junior: E. MacKenzie (B.) 1, J. Smith 2, M. Gow (B.) 3.

INTER-SECONDARY SCHOOL ATHLETICS.

Some remarkable performances were put up at the annual athletic tournament of the Auckland Secondary Schools this year. Owing to the excellent condition of the track and the fine weather eight records were established. Wordsworth (Sacred Heart) clipped 1 1-5 secs. off the Senior half mile record. Sayers (Auckland Grammar), winner of three titles, established a New Zealand secondary school record for the quarter-mile, registering 51 2-5secs. Cruickshank (Auckland Grammar) cleared the bar at 5ft. 7in. in the senior high jump, also beating the New Zealand Schools' record. In the mile, Watt (Auckland Grammar) took the lead from the pistol and returned the excellent time of 4mins. 33 3-5 secs, beating the record established by him last year by 11 seconds. Last but not least Clarke (S.M.T.C.) broke the junior half-mile record, winning the race easily. How the hearts of the Technical supporters bounded as Clarke followed gamely by Herring lead the field home in this race!

This year the Technical College team enjoyed a greater measure of success than it ever had before. In the senior section Wakefield followed up his success in our own championships by winning the broad jump. Just as in the case of Flyger last year in the high jump, Wakefield failed to get the record by a very narrow margin. There is no doubt that Wakefield has the makings of an ideal long-jumper and it was remarked by a capable judge of jumping present that Wakefield was the only competitor with the requisite floating action in mid-air.

In the Intermediate section, Emus is to be congratulated on a splendid 440 yards in the relay. If Emus had kept closer up to the leaders in the 440 yards championship, he would have won this event. It was distinctly the case of a race thrown away through lack of judgment.

Among the juniors the outstanding competitor was Clarke, who won the 880 yards in record time and was also third in the 440 yards. Morrison did well to get third in the 100 yards while Herring ran pluckily to get second to Clarke in the half mile. In the junior relay the Technical team ran second to Auckland Grammar who broke the record for this event. It is particularly gratifying to note that Seddon Memorial Technical College was runner-up in the junior section to Auckland Grammar. This would seem to augur well for the future. The members of the team were:—

Senior.—Wakefield, Borich, Wadey, Robinson, Fry, C. Thorpe, Wilshere. Intermediate.—Emus, Jensen, Rawnsley, Stevenson, C. Thorpe, Waldron. Junior.—Morrison, Harrison, Bruning, Clarke, Covey, Herring.

SWIMMING.

JUNIOR BOYS' QUARTER RECORD.

In a trial at the Tepid Baths last evening, Alan Pascoe, a 13-year-old member of the Waitemata Club, swam 440 yards free style in 5.47, which is 3-5s better than the New Zealand record, established at Auckland by Leslie Olds, of Dunedin, in January, 1927. Pascoe's swim was made under conditions entitling its recognition as a record. In a previous attempt, when he had been paced by other swimmers, he had done 5.40, but the use of pace prevented recognition of the time as a record.

—"Star," 28/8/34.

To a yachtsman, this may sound fantastic for the first time, but I will endeavour to explain it a bit further. (See diagram 3.) To commence with, a good sail is a smooth, continuous curve. This curve is obtained by careful cutting and joining of the numerous stripes or cloths that make the sail. Most of this curvature is close to the mast and thence flattens out to the edge or "leech" of the sail. This flatness is often emphasised by light wooden battens inserted in pockets in the sail. The wind strikes the sail as shown by the arrows, and has its velocity increased as it passes over its surface. On the other side of the sail the wind shoots clear of the cloth, as shown. This means that some of ae air originally behind the sail is drawn away aft by the windstream shooting past the end of the sail (the leech). This tends to cause a lessening of pressure on the lee side of the sail which, coupled with the pressure, tends to impart a forward drive to the boat. Now to go a step further, and to consider the refinements found on modern rigs.

It will be seen that most of the vacuum will exist close behind the mast, at the point marked A. If this is so, then this area should be as great as possible. This is ensured by having a tall, narrow rig, such as is found on the modern "Bermudan" rig. (Often wrongly termed "Marconi" rig.) Then again, most boats have one or more headsails. Of course, these sails are put on for practical purposes, in the main, so that the balance and steering of the boat can be adjusted. But in a modern racing boat, these jibs are often very much larger than is necessary for balancing purposes and extend back behind the mainsail. Their purpose is to increase the vacuum behind the mainsail.

(Take the case of a single headsail—Diagram 4.)

This they do by increasing the speed of the wind through the gap x, thus drawing more air away from the lee of the mainsail and thereby assisting its drive. In order to ensure this these headsails for "Genoa" jibs, as they are called, must be very carefully cut and sheeted, otherwise they will destroy the vacuum, rather than increase it.

There are many other points that have been evolved from a consideration of theory. Some of these have been adopted, others have been cast out when it was found that they would not meet the exigencies of practice. As always, theory and practice clash. A high, narrow mainsail is efficient, but the rig is dangerous if carried to excess. Battens right across the sails help tremendously in ensuring a perfect "set," or curvature, but are liable to break if the sail should flap. And anyone who has had to reef a battened sail in a bit of a sea, or crawl painfully up a tall mast in an ocean roll to clear a jammed halyard block will agree that efficiency has often to take second place to ease of handling.

Still this same efficiency may also give the same person a feeling of deep satisfaction when his boat goes out to windward of his rivals to lead them across the finishing line and "bring home the pot." And a happy medium between the two may ensure both.

Of course, there are many other points in which efficiency can be improved by a knowledge of mechanical theory, or the theory of its allied subject, hydraulics.

Unfortunately, space forbids that I enter here into a discussion of such important subjects as streamlining and balancing, but here again practice has outpaced theory, and there is still room for enterprising designers to improve on our present means of locomotion, whether in the water, on land, or in the air, but more especially in the water.

Mt. Ngauruhoe from the Chateau, North Island, New Zealand.
—By courtesy of New Zealand Government Publicity Department.

THE IMPORTANCE OF MILK.

NATURE'S PERFECT FOOD.

Because New Zealand is a dairying country, it would seem probable that we should be a milk-drinking people. We are, however, not great drinkers of milk, and it seems strange that statistics collected by the New Zealand Health Department show that the families of share-milkers on dairy farms drink less milk than any other section of the community. There may be some reason for this; we cannot believe that the children are being deprived of milk so that the factory cheque may be bigger. What seems probable is that they are "tired" of milk, partly because they see so much of it, and partly because it is unpleasantly associated with early rising, cow-sheds, tired backs, etc. At the same time they have never realised the enormous value of milk as a food for themselves. One would think that the feeding and consequent growth of calves, pigs and puppies would be an object lesson to them, and that they would appreciate milk more when they see that a new calf getting only fresh milk for the first few days of its life, and then a mixture of whole and skim milk, and then skim milk with perhaps a little linseed meal and a little grass doubles its weight 47 days after it is born; or that a puppy, fed on its mother's milk alone, is twice its birth weight at 9 days old. If they connect milk with growth and apply it to humans, they will probably think only of babies, and are quite willing to admit that babies must have milk. However, as soon as they are old enough to eat "grown-up" food, many of the children begin to refuse milk. In doing so, they are doing themselves a life-long injury. This is a very sweeping statement to make; but we will endeavour to prove it to you.

Milk is the only article of diet whose sole function in nature is to serve as food. It contains in remarkably good proportions, all the compounds necessary to support life, and in particularly assimilable forms. It is the basis of the infants' diet and is specially suited to the need of certain classes of invalids. For the normal, healthy adult, it is undesirable as the sole article of diet, because the proportion of water is so high that too large a quantity would have to be taken to supply all the essentials of an adequate diet. Its value is as a supplement for other foods, correcting their deficiencies.

The Constituents of Milk.

The mineral matter which is present in milk is made up of all those mineral salts which are necessary for growth, excepting that it contains very little iron; but the iron present is in an especially valuable form. Therefore, it should be noted that when milk is the chief source of nutriment, as with infants and young children, iron must be supplied by the addition of other food such as egg yolks and spinach. The most important of these mineral salts are calcium and phosphorus.

Calcium plays a very important part in the formation of a strong bony framework, the proper development of the jaw-bones and good sound teeth. If the bones are not sufficiently rigid and so are unable to hold up the weight of the body or to resist the pull of the muscles, they become bent and distorted and we say the person is crippled through rickets. Badly formed bone is also liable to be attacked by many diseases such as tuberculosis, which, once it penetrates into the soft inner part of the bone, is most destructive and difficult to cure. Again when a baby is old enough to stand, the shaft of the long leg bones should be able to take the weight without becoming either knock-kneed or bow- legged.

For building purposes, teeth require large quantities of calcium. Enamel is the hardest thing in the body and if the softer inside or

dentine of the tooth is protected by a thick flawless layer of enamel, it is improbable that the tooth will ever decay.

During infancy when the child lives largely on milk, it usually receives a sufficiency of calcium and phosphorus salts and of Vitamin D. These are supplied in the mother's food, or, if that does not contain enough calcium, it is supplied from the bones and teeth of the mother. (This also happens before the baby is born and explains why the teeth often give considerable trouble at this time.) This is, of course, very damaging to the mother, but nature apparently considers that the child's need is the greater. Hence it is evident that the nursing mother requires an adequate amount of calcium in her diet.

Another effect of calcium in the body is that among the alkaline salts in the body, which are used to neutralise acids, are calcium ones and these are also concerned in the clotting of the blood. If there were no calcium in the blood we should run the risk of bleeding to death from every little cut or scratch.

Again, calcium salts strengthen the action of the muscles. For instance, the blood passing through our heart contains calcium salts which impart "tone" to it and make its beat strong and deep and so improve the circulation of the blood. It is a well-known fact that if the blood carries the necessary supply of calcium salts, one would not be subject to the formation of chilblains.

To find out the amount of calcium needed in the body every day many interesting experiments have been carried out. The most recent and conclusive of these has proved that for children of all ages from 3 to 13 years, an average intake of not less than 1 gram per day is essential. It has also been proved that the best storage results for bone formation are produced when calcium is furnished mainly in the form of milk. Hence it seems better to state the desired amount not so much as a weight of calcium, but as the amount supplied to the diet containing 1½ pints of milk per day. Adults, of course, need less calcium as their bones are already formed but they do need a certain amount to replace what is excreted and lost from the body every day.

The phosphorus salts found in milk are also most important because they enter into the composition of all cellular structures, of bones, and of nervous tissues. It is involved in maintaining the neutral reaction of the body fluids and in this way it is also involved in absorption and secretion. An inadequate supply of phosphorus compounds may be the cause of malnutrition, especially among growing children.

Vitamin Content of Milk.

Milk is also rich in Vitamins, containing large quantities of Vitamin A, a smaller quantity of Vitamin B and varying amounts of Vitamins C and D.

Let us then consider the functions of these Vitamins present in milk.

Vitamin A maintains general health and promotes normal growth. When this vitamin is absent or present only in a small amount in the diet of a young child, its weight begins to decline, its digestion and appetite are disturbed and eventually it will develop an infection of the lungs, the sinus, the ears, the bladder and the skin.

Vitamin B promotes growth and its absence from the diet causes the disease known as beriberi in which there is degeneration of the nerves which results in paralysis and which occurs when people live too largely on a diet of highly refined foods.

Vitamin C. Raw milk contains varying quantities of Vitamin C, depending partly on the diet of the cow. Vitamin C prevents and cures scurvy. The symptoms of mild scurvy are much like those of malnutrition—failure to grow, loss of weight, pallor, irritability and lack

of vitality. It is also necessary for the production of sound teeth and therefore every growing child should receive a liberal supply.

Unfortunately, in boiled and pasteurised milk, much of this vitamin originally present has been destroyed. Hence the use of such milk in the feeding of infants will result in the development of infantile scurvy unless some fresh fruit or vegetable juice is added to the diet.

Vitamin D is one of the most important vitamins. Its function is to help regulate the utilization of calcium and phosphorus in the body. An insufficient supply of this vitamin results in:—

(1) A lowered condition of the intestinal tract.

(2) A lowered concentration of calcium or phosphorus in the blood.

(3) Defective calcification of bones, e.g., Rickets, and retarded growth.

Thus you must admit that the value of milk as a food is unappreciated by many people. It is frequently regarded as a beverage rather than a food, when, in fact, a quart of milk is equivalent in fuel value to approximately nine ounces of white bread, one pound of lean beef, and in addition about as much fat as is supplied by one and a half ounces of butter, over one and a half ounces of milk sugar, and valuable mineral salts.

Compared with other animal foods, milk is a cheap food and should enter freely into the dietary. It need not be used as a beverage, but may be combined with other materials in soups, sauces for vegetables, custards, and used in cooking cereals.

From the above facts it is quite clear that if people include in their diet as much milk as possible, it is practically impossible for them to suffer any deficiency diseases, but on the contrary they will be so strong and sturdy that they will be able to build up a higher power of resistance, which will fight against ordinary diseases. For this reason, milk is known as a protective food—and we are quite sure that everyone will agree that protection is better than cure.

PASCALL

A BRILLIANT FRENCHMAN.

Blaise Pascall was born in 1623. He was certainly a precocious youth. Up to the age of 12 his father had kept him away from mathematics, but interested in, although not allowed to study, a geometry book, Blaise promptly worked out the elements of geometry for himself. Not long after he was admitted to the French Academy, and, while still a boy, wrote a treatise on the difficult subject of Conic Sections.

He was always somewhat of a religious mystic and later in life, on the death of a favourite sister, he turned his attention to theology, giving up mathematics as an invention of the devil. Soon after, however, he turned again to the subject. But, being only narrowly saved from certain death, he considered he had had a call to abandon the world. So he gave up such worldly studies and turned once more to religion and philosophy.

One night, while suffering from insomnia and toothache, he started a treatise on the Cycloid. His toothache stopped; this according to him, was a call to carry on and in eight days he finished the work. Soon after this he died.

INSECT PESTS AND THEIR CONTROL

To the agriculturist, insects constitute the most important class of all injurious animals. The subject of economic entomology deals with the characteristics of the harmful species and with their control.

The importance of the insects as a class is well denoted by the fact that of all species of land animals, insects, with approximately 450,000 species recorded, comprise 80 per cent. It has been calculated that one-tenth of the world's crops is annually destroyed by insects alone. The main reasons for this numerical supremacy lie in the anatomical constitution of the insect. Their racial persistency is well exemplified by the presence of an abundance of undoubted insect fossils in the Carboniferous strata, and of groups closely allied to them as far removed as the Silurian deposits.

The metamorphosis of the higher orders of insects is such that the life of the insect is, after the egg, divided into three stages, viz., the larval or "grub," the pupal or resting and imago or adult. Both the larva and adult are active, the pupal stage being a period of quiescence. In the main, it is only in the larval stage that actual damage is done, the adult stage being one devoted to the continuation of the species (the most notable exception being that order comprising the beetles, Coleoptera). In those orders having incomplete metamorphosis, the change from young to adult is more or less direct, no definite, inactive pupal stage being present. In the control of such insects (e.g., aphides) it is to be remembered that throughout their whole development they are destructive.

For the successful control of any insect outbreak, it is essential that the life-history of the pest and its method of damaging the crop are known. The class into which this damage falls and thus the control measures to be adopted, depends primarily upon the mouth-structure of the insect. At any active stage of its development, an insect may be classified as having either a mandibulate or a haustellate type of mouth, that is to say, it will obtain its food by one of the two processes of biting and sucking. There are, of course, modifications of both these types, as, for instance, in the Hymenoptera (bees, etc.), where the trophi, though basically mandibulate or biting are very often supplemented by a haustellate or sucking process.

An important method of insect control is by spraying. According to their action, sprays may be grouped under the three general headings of poisons, corrosives, and suffocating or asphyxiating insecticides.

Arsenate of Lead.

Of the poison sprays, arsenate of lead is the most effective and is the most commonly used. It is employed in combating chewing insects, such as beetles, caterpillars and the larvae of sawflies. A study of the life-history of the pest will determine the most effective times to spray; local climatic and cultural conditions will invariably have some influence upon such a schedule.

For general purposes, a standard arsenate of lead spray is prepared by mixing 1½ lb. of powder or 3 lb. of paste to every 100 gallons of water. Under Auckland conditions, the most successful treatment for codlin moth and the leaf-roller caterpillar is a series of from three to seven applications as follows: at petal-fall, ten days later, and at further intervals of from ten to fourteen days. For the latter pest on peaches and similar fruit trees, it is necessary to reduce the quantity of powder to 1lb. per 100 gallons of water, adding 3 lb. of hydrated lime per 100 gallons of spray to prevent injury. Other important pests

controlled by the use of arsenate of lead are the bronze beetle, the white butterfly, the pear slug, and other caterpillars and beetles attaching the leaves or fruit.

The Oil Sprays.

While the poison sprays are used against biting insects, sprays belonging to the other two groups are used principally in the control of piercing, soft-bodied insects and their eggs. Oil sprays, which are the principal asphyxiants, control those piercing-mouthed insects which, though usually possessing a soft integument, are often protected in various ways. This protection may take the form of a waxy coat, as is the case with the woolly aphis and mealy bug, or it may consist of a waxy shield, as with the mussel scale. Depending upon use, oil sprays may be divided into two distinct groups, the winter and the summer sprays. The former are used on deciduous and citrus trees during the winter months only, for combating pests overwintering on the tree. For woolly aphis and the majority of scales, a concentration of 2 to 3 per cent is sufficient, 4 to 5 per cent being necessary for the San Jose scale on deciduous trees. An oil-film must be deposited which is of sufficient heaviness and viscosity, yet with a low enough volatility to endure a sufficient length of time to destroy the pest.

In summer, on the other hand, the insects and their eggs remain relatively unprotected, rendering a heavy film of oil unnecessary, and, indeed, decidely detrimental to the physiological processes of the trees, which are then in leaf. To obtain maximum results, the spray must be applied when the pest is most susceptible to treatment; a second application, especially in summer, is most desirable. The following table shows the most suitable strengths for applications of standard specifications:—

Pest	Strength of Spray.	Time of Application
Black and green aphis	1%	When pests begin to appear in numbers, and 4 or 5 days later, if others noticed.
Cherry slug.	1%	As for aphis. On trees harmed by arsenate.
Leaf hoppers (apple).	1.5%	When nymphs appear.
Red mite.	1.5% to 2%	First week of Feb., and 10 days later. Summer oils always preferable.
Scales on citrus.	2% and 4%	4% during winter. Other times (especially Sept., Oct.), 2%. Summer oils superior even in winter.

Used as an insecticide, lime-sulphur appears to be mainly asphyxiating in its action, due to its absorption of oxygen, and is usually of little value as an ovicide. Its principal use is as a winter spray against red mite and San Jose scale, and as a summer spray against red mite, young scales and aphides. Lime-sulphur is prepared by various methods, but since the insecticidal value depends on the polysulphide content, it is upon this basis that dilution is best effected. For general summer use, a polysulphide content of 0.1% is suitable, the concentration varying at other times with the susceptibility of the tree to spray-burn, depending upon bud-formation or general seasonal growth.

Corrosive Sprays.

The corrosive sprays, used against aphides, young scales, etc., include mainly kerosene emulsion, quassia wash and the nicotine series.

Nicotine sprays, which are prepared both in the form of liquid extracts of nicotine and as nicotine sulphate, are widely employed in checking attacks of unprotected, soft-bodied insects. For outdoor use, a concentration of 0.075% is suitable, and 0.05% under glass. Nicotine sulphate must be used in conjunction with an activating agent such as soap or an alkaline spray like bordeaux or lime-sulphur. Sprays appear superior to nicotine dusts, which deteriorate in storage and are expensive. As a fumigant in glasshouses, nicotine is quite effective. Kerosene emulsion can be used for much the same purposes as the nicotine sprays, and is often used additionally against the diamond-back moth and turnip "fly."

In many cases, where spraying is not feasible, special methods have to be adopted. Such is the case with the lemon-tree borer (Aemona hirta), which is destroyed by injecting kerosene or benzine into the burrow and plugging the entrance with wet clay or putty. In limited areas, fumigation is useful for subterranean pests like the grass grub. Fumigation with carbon bisulphide is practised in the destruction of weevils in stored grain. It must also be remembered that in spraying, useful as well as harmful insects are destroyed, and leave a clear field for further attack. Spraying therefore, has to be systematic.

It should always be borne in mind that by means of winter shelter, destruction, and rotation of crops, a great deal can be done to ameliorate the effects of insect depredations.

The method of biological control of pests by parasites is one that is rapidly claiming the attention of economic entomologists throughout the world. Since the introduction of the Aphelinus parasite a few years ago, the woolly aphis ceased to be a serious pest in New Zealand. At present, important work is being done with regard to the distribution of the two ichneumonid parasites of the white butterfly (Apanteles glomeratus and Pteromalus puparum). It is to be expected that, as man's knowledge of these groups extends, biological control will assume even greater importance than it holds to-day.

GRAIN AND DESIGN.

THE VALUE OF VENEERING.

All woodworkers are aware that grain plays an important part in the design and execution of any piece of work. If solid wood is being used the lay of the grain is one of the most important considerations; in fact, the whole structure of design in material is based on a study of the nature of that material. In wood, grain is a specially important feature because the strength of the wood depends on the direction of the grain. A thin strip cut across the grain is very frail, whilst a strip of similar section cut down the board may stand severe stresses without breaking. Design in woodwork is based upon this fact, and it is good in this connection to examine any framework or structure and notice how the various members are adapted to take the strains to which they are to be subjected.

The appearance of the finished article has also to be considered, and it is worthy of note that if the article is well designed from the point of view of fitness it will also be pleasing in appearance. This is particularly noticeable in boat work where strength and lightness are of paramount importance. Examine the "knees" and notice how the timber is selected and cut from twisted oak boughs in such a manner that the grain follows the curve of the knee. Such pieces fetch good prices, since they are cut especially for this and similar work. On some old-timbered house, again, you may find an oak lintel or beam which appears to be sagging or twisted out of its original shape. It was hewn thus in order that it might have its full natural strength. Had it been sawn straight, its resistance might have diminished by twenty-five per cent. or more.

In the design of furniture careful consideration must be given to the proportions of stiles, rails and panels, since, owing to the nature of wood, these form the principal structural features, varying with the requirements of the piece in size, shape and position. By them its appearance is either made or marred. With veneered work appearance is the chief consideration and more latitude is allowable, as the structural features do not necessarily appear in the finished work. In passing, it may be said that for this reason some very poor quality work is on the market, and anyone buying veneered stuff should be careful to see that its beauty is something more than skin deep. A little veneer may cover a multitude of sins and this fact has to some extent brought veneered work into disrepute. Given sound construction and workmanship there is no reason why a veneered piece should not hold pride of place with any other type of work.

The value of veneering is that it opens up a field of design which would be impossible without the application of veneers. Apart from the limits of design imposed by structural features, some of the burrs, for instance, would be impossible to obtain in the required sizes if solid wood were insisted on, and even if construction were possible the warping and twisting of the timber would quickly destroy the utility of the piece. In any case the cost would be prohibitive and the advantage nil.

How the Grain is Distorted.

Grain is, of course, a feature common to all wood owing to the nature of its growth. Everyone knows of the "rings" which form in the tree with the passage of the sap and the formation of new wood in autumn and spring, commonly called the annual rings, but all grain convolutions are not of truly natural origin. The "eyes" in bird's-eye maple—a wood at one time very much in demand—were formed by spiking the tree at intervals. The punctures formed by driving in a steel spike were healed by the tree's natural growth and the twists so produced formed the much-desired eyes. Burrs on walnut trees are often the natural distortion of grain due to the presence of parasites which penetrate the bark and cause a protuberance of twisted wood to form in an endeavour to heal the wound and expel the cause of irritation. Similar burrs can be seen on elms but they are of comparatively little value. Artificial burr is produced in walnut by beating the tree and generally disturbing the even formation of the wood cells.

The charm of a piece of woodwork depends greatly on careful choice of woods of suitable grain and colour, and a well-designed piece will not require the embellishment of coloured plaques, complicated mouldings and inlays. A great deal of the work one sees in shops is spoilt by over design or by wrong choice or wrong treatment of woods. Ill considered mixtures, too, are to be avoided. Oak does not mix with burr walnut nor is it improved by inlay. It is best left alone. Carve it if you like, but let your designs be indicative of the material on which they are based. A sturdy honest timber needs sturdy, honest design if it is to show to the best advantage. A well designed piece of limed oak is a thing of joy. Fit it with spindle legs, appliques and doo-dah handles in jade for a lady's drawing-room and it is an abomination.

—"The Woodworker."

POISON GAS.

A SHORT SURVEY OF A SERIOUS SUBJECT.

In this account of modern chemical warfare I am not so much concerned with its ethics as with its effects since ethics do not seem to enter into twentieth century ideas of war. War can be prevented only by a scientific study of its causes and, until this is done, we shall be working in the dark, and can, at the best, achieve results by chance. Before 1915 a soldier's business was to push or hurl bits of metal into the enemy, and war was thought to be a romantic pastime fit for gentlemen. Modern war is waged by mechanics and mass-production methods have been brought from the factory to the battlefield.

As early as the eighth century, A.D., chemical warfare began. In that century the Greek Callinicus invented the well-known Greek Fire. Precisely what this was is unknown but it is reasonably certain that it was a spontaneously inflammable substance that stuck to whatever it hit. This invention prolonged the life of the Eastern Roman Empire for a further seven hundred years. Wars are usually won by the army with the most efficient weapon and the Greek Fire had a great psychological effect even if it did not cause many casualties because it made attackers keep their distance from fear of the terrible burns it produced.

The 1907 Hague Convention renounced the use of projectiles for diffusion of harmful gases. Belligerents were thus barred from using lachrymatory gases but were allowed to discharge gases from cylinders lying on the ground which was the method used by the Germans in their attack on the Canadians on April 22nd, 1915—the first use of poison gas in modern warfare. It is no new thing in the world because the bombardier beetles use an acrid gas to repel their enemies, and the use of stink gases is well known by those who have been unfortunate enough to discover a Maori bug.

In the Great War about twenty-five different poisons were used with varying effects. Of these, three were gases under ordinary conditions. The remainder were liquids which gave off poisonous fumes, or solids poisonous in the form of smoke or fine dust in the air. They may be divided roughly into four classes. The first have no effect on the skin but are poisonous when breathed. Examples of this class are chlorine and phosgene. These gases are all kept out by reasonably efficient respirators and are now obsolete. Gases of the second class are poisonous only in high concentrations, but in extremely small amounts will irritate the eyes so that copious weeping is produced. One part of a gas of this type in five million parts of air, will make the victims helpless, because the tears streaming from their eyes will blind them. Close-fitting goggles are an adequate protection from this type of gas.

The third type of gas consists largely of arsenic compounds which in small amounts produce sneezing. When larger amounts are used a pain is felt in the nose similar to the sensation produced by fresh water inhaled into the breathing passages. When more is breathed in, the pain in the head becomes more intense, and is felt also in the chest. The chief result of this type of gas is to produce mental distress and misery. The victims sometimes become violently insane; some have to be forcibly prevented from commiting suicide while others try to burrow into the ground to escape from imaginary pursuers. In the majority of cases recovery is complete in forty-eight hours. The much talked of gas, "Lewisite," used by the Allies in the closing stages of the war, was of this type.

The Dreaded Mustard Gas.

Blistering gases form the fourth type of gas. These gases are poisonous when they come in contact with human skin, and when breathed. They produce large watery blisters and will remain active for weeks or months. The best known of this class is mustard gas or di-chlorethyl-sulphide. In the later stages of the war most of the gas used was of this type. Since this gas is so well known it merits a paragraph by itself.

One drop of mustard gas on a sheet of paper placed on a man's sleeve will raise a blister on his arm in five minutes through his coat and a woollen shirt sleeve. At the Chemical Warfare centre at Aldershot one officer spilt one drop on his boot. As a result he spent three months in hospital waiting for the effects to pass away. When he was discharged from hospital he developed the same symptoms again and it was found that he had worn the same pair of boots again and that the mustard gas was still in the leather. It is said that someone placed a drop on the chair of the Director of the Chemical Warfare Research Institute and that the Director as a consequence took his meals off the mantelpiece for some time after. Even a small blister from this gas takes about six weeks to heal. This gas caused more casualties in the Great War than all the other gases put together. German aeroplanes dropped pamphlets over British lines explaining how those who were tired of the war could become casualties without the least danger, by rubbing a bit of earth, which had been exposed to mustard gas, on their skins.

These gases were used during the war with varying effects. The most remarkable attack was one by the Germans on the Argonne in 1915. The Germans employed a lachrymatory gas—probably benzyl bromide—and the French were led back to the German lines by soldiers wearing goggles. When the German Command announced that the prisoners numbered 2400 the French protested that that was their total loss. What had happened was that the French were rendered helpless by blindness and offered no resistance to the raiding force. The British forces suffered twenty thousand casualties from the poison gases belonging to the first class, but the mustard gas casualties exceeded 150,000. Of these, four thousand died and seven hundred became permanently unfit. The percentage of deaths is less than three. Shell fire results in the death of one third of its victims.

It is improbable that any new gases will be found capable of passing through a respirator that will stop mustard gas and chlorine, because there are only a limited number of gaseous substances possible, and nearly all are already known to scientists. Mustard gas was known in 1886, and its effects recorded in the scientific journals of that year. Early in the war the British Staff rejected a suggestion for its use, because it only incapacitated its victims, it would not kill them. However, it is possible that smokes may be found which will pass a respirator. It is easy to absorb a gas, but a smoke or fog will get through most filters and a dense filter will impede breathing to such an extent that soldiers would be unable to move about. Smokes such as "Lewisite" could be used with other gases. The sneezing and vomiting induced by the smoke which had passed the respirator would make the victim remove his helmet; the poisonous gas would then be able to produce its effect on the unprotected man. The German "Blue Cross" shells contained this type of mixture but the British respirators were able to deal with it.

The Danger of Gas Attacks in the Future.

In modern war gases are used to blister the enemy, and to make him wear a gas mask and so tire him out. Ground can be made untenable by spraying with mustard gas and the attackers could use

air tight tanks to advance as the enemy were driven back. Gas-proof clothing would be impracticable because of its weight. If a gas could be discovered to which men could be immunised it would be possible to use it and immune troops to follow it up. The Americans discovered that about twenty per cent of white, and eighty per cent of coloured soldiers were more or less immune to mustard gas. Since the effects are similar to violent sunburn it is understandable that negroes should be more immune than whites.

It has been suggested that a few aeroplanes could poison a city like London in one night. The calculation upon which this statement was made was wrong. A decimal point had slipped. We can compare the effects of gas with that of explosives. Between March 11th and 14th, 1918, the Germans fired 150,000 mustard gas shells into Cambrai, an area of twenty square miles—about the same area as central London. There were 4,500 casualities of whom fifty died and all of these took off their gas masks too soon. In London the casualties would be about ten times greater without gas masks. Compare this with the effects of high explosives. There would be tens of thousands of casualties and hardly a house untouched. Either of these effects would have to be the result of repeated visits by a fleet of a thousand planes. Houses are more vulnerable to high explosives than to gas, because explosives cause damage to occupants through the houses collapsing, while second floor rooms, with doors and windows shut, would be free from gas. If mustard gas were used the civilians could evacuate the area, whereas soldiers have to stay. From these facts it will be seen that large towns will still be capable of existence in the war of the future.

If a humane method of fighting should be sought it would be possible to devise some code making a tear gas, such as ethyl iodo-acetate, the only weapon and forbidding the wearing of goggles. Since those who organise wars are not concerned with the humanity of it, it is probable that the next war will see soldiers driven mad with "Lewisite," or similar gases, and put out of their misery by mechanics driving gas-proof tanks. If anyone still believes in the romance of war his belief will not survive the next one.

ASPHALT IMPREGNATED CONCRETE

Reprint from "The Technical Flash," Nova Scotia Technical College, Halifax, Canada.

Although concrete has many important uses in this age, it has the one great limitation of being subject to the erosive action of air, sea spray, and some liquids. This is a very serious problem where concrete is used for piling, bulkheads, and similar structures in the marine service, or in sewers, tanks, dams, and the like. The destructive action of sea water has been so frequently commented on in recent years that it seems scarcely necessary to elaborate to any great extent in the subject.

To review the matter briefly, it may be recalled that the destructive action of sea water on concrete is due to both physical and chemical causes, and that this action is progressive. Abrasion, or the formation of ice in concrete, permits the sea water to reach into the concrete, while chemical actions also contribute to the physical destruction.

Reinforced concrete is subject to the action of sea water and sea air, caused, in part, by the chemical action of the sulphate in the sea water on the lime of the cement. This produces calcium sulphate,

which replaces a part of the calcium hydrate of the cement. Since the calcium sulphate molecule is slightly larger that the calcium hydrate molecule, a swelling takes place during this reaction, adding a physical action to the chemical action under way. Upon crystallization, this compound takes up a good deal of water, which produces a great increase in volume and causes the concrete to crack. The sea air reaches the steel resulting in erosion. The steel oxidises, expands, spoils the concrete, and exposes the steel to the air.

The impregnation of cement concrete with asphalt under vacuum pressure, however, secures the penetration of the asphalt into the concrete to a depth of one and one-half to two inches and effectively insulates the concrete from the destructive action of the sea water and sea air. This process is now widely used.

Pre-cast asphalt-impregnated concrete slabs are manufactured which can be adapted to construction of any shape or size to fit tanks, pipes, breakwaters, concrete bridge floors exposed to sea spray and the like. They are also adapted for use in insulating conduits, irrigation ditches, and sewage disposal tanks where acids and alkalies would otherwise act injuriously to the concrete. The wide-spread uses to which asphalt-impregnated concrete can be applied have really resulted from many years of work directed toward the creation of a cement concrete piling that would resist the action of sea water.

Asphalt-impregnated piling, so deeply impregnated as to provide practically perfect insulation was developed by the Harbour Department of Los Angeles, and by engineers and chemists working in association therewith. This piling is now being produced commercially by the Pan-Pacific Piling and Construction Company of California.

How the Concrete is Impregnated.

In early experiments, an attempt was made to impregnate concrete by immersion in an asphalt bath heated to 450 to 500 degrees Fahrenheit, for from fifteen to twenty hours. By this process, adequate impregnation of the concrete by asphalt was usually secured, but the destructive high temperatures and necessarily lean-mix concrete, limited the success of the process. A vacuum-pressure process for the treatment of concrete, similar to the creosote treatment for lumber was then developed.

By this method, called the denocrete process, the concrete slab, after thorough curing, is subjected to dry air treatment in a tempering chamber at 250 degrees Fahrenheit, the vacuum being maintained ually raised to 240 degrees Fahrenheit, at which it is held for from two to four hours. The slabs are then rapidly moved into the main heating chamber which has been pre-heated and dehydrated under a twenty-six to twenty-eight inch vacuum, to produce a vacuum in the concrete pores. The temperatures are not high enough to release an appreciable quantity of the combined water of crystallization.

Thoroughly dehydrated grade D asphalt is turned into the heating chamber for eighteen or twenty hours, the temperature being grad-throughout the introduction. When the chamber has been filled with asphalt, the vacuum is replaced by air pressure at 175 pounds per square inch, this pressure being maintained twelve to fourteen hours. The temperature is then dropped to 200 degrees at a rate not exceeding eleven degrees per hour. The slabs are then cooled gradually, this cooling process being as carefully controlled as was the heating process. A dry mixture of concrete is used in the slabs or shell.

This process impregnates so thoroughly, to a depth of one and one-half to two inches, that it completely seals the pores of the concrete and secures the asphalt to its surface.

SIR ISAAC NEWTON

AN ENGLISH GENIUS.

Isaac Newton is a name that comes familiarly to most schoolboys' lips—especially those, mechanically minded, who have been caused to learn his "Laws" by heart.

But the writer feels that his true greatness goes unappreciated by most people. That he was one of the greatest, possibly the greatest English genius, is undoubtedly true.

When he was sixteen he went to Cambridge University. Here it seems that he did not distinguish himelf to any remarkable extent. The examiners commented, when he entered, on his lack of knowledge of geometry. It appears that, soon after leaving school, he purchased a copy of "Euclid" but found no interest in it—remarking that the theorems appeared self-evident and not requiring proof!

After graduating at Cambridge he had to return to the country for some months owing to an epidemic of some sort. It was during this time that his first original work was produced—this work was actually the origination of the Infinitesimal Calculus. Think of this—an entirely new branch of Mathematics thought out by a young man not 20 years of age. By this and following work, his reputation was assured, and some time later he went back to Cambridge as a professor of Mathematics.

From this time his life may be divided into two parts. The first lasts until he was fifty, covering that period during which he remained at Cambridge. He was engaged in the production of nothing but entirely original work in mathematics, mechanics, and astromony. It was he who first formulated the idea of Gravitational Force, and, as a result, he was able to gain some idea of the movements of the planets round the sun. He was also the first to analyse white light into the spectral series. In the course of his astronomical work he constructed at least two telescopes himself. These telescopes are now treasured exhibits in English Museums.

When Newton was about 50 years of age, a change was to come to him. He had spent all his years so far as a college recluse. He was still a bachelor and was unknown to the world at large. At this time the British silver coinage had been so debased as to be almost worthless. Now Newton had studied, amongst other things, the infant science of metallurgy and, as a result, obtained the position of Warden of the Royal Mint. As Warden he set to work, and with conspicuous ability, revaluated the coinage. As a reward for his efforts he was made Warden of the Mint and knighted. With a niece acting as hostess he now ventured into the social world; and his dinner parties were in great demand. He still took a wide interest in Mathematics and became President of the Royal Society, which position he retained till his death—at the age of 84.

It is related that when he was nearly eighty, and feeling unwell, he went to a doctor, who recommended that he stop living what would now be termed a "fast" life. His active old age was remarkable in view of his irregular earlier life—when he seldom went to bed till 1 or 2 in the morning, and missed many of his meals. Of his published works his "Principia" is probably the most famous of English works on Mathematics.

Esparto grass is used in the paper-making industry. Great Britain buys about 200,000 tons of the grass every year. Formerly, most of this grass came from Spain, but nowadays Algeria, Tunis, and Tripoli, supply the "Alfa grass."

THE FARM AREA AT BENSON ROAD.

If modern conditions have shown nothing else they have directed attention to the necessity for a more serious study of farm problems by a well-trained rural community and also to a fuller realization of the value of a sound education for the future farmers of New Zealand. Success has been achieved by many in recent years who have had courage enough to depart from routine farm procedure and develop holdings with a variety of interests rather than only one. Within the past year the College has begun the development of a farm along these lines—horticulture in all its branches with glasshouse work, poultry keeping, and beekeeping. Cows and pigs will be later obtained to make the farm a self-contained unit. It is felt that any boy with knowledge gained from this farm and sufficient ambition, will not be hampered by lack of capital but will be able to begin in a small way and build up an independence. The following are some notes on the development of the farm:

In September, 1933, the area at Benson Road, Remuera, was in a very rough state. Second year boys spent some hot weeks in the initial clearing, thus allowing half the area to be cropped that season. The yield was sufficient to provide all the vegetables for the Health Camp at Rotorua for 50 boys for three weeks. In fact, one crop of potatoes on the freer land was planted on 4th October, dug 3 months later and yielded over 11 tons to the acre. The land has since been filled and drained and a road built to allow motor entrance to the middle of the area. The largest part of the work has been done since February, 1934, by boys of the Agriculture course in their first year.

A poultryhouse was built for 24 pedigree black orpingtons. This was followed by incubator and brooder rooms. It is intended to rear over three hundred chickens during the present season with housing increased accordingly. This produce will be retained as laying stock and will form, with imported blood ,the basis of a breeding stock for future expansion.

Arrangements have been made for the development of an apiary. This will expand to about a dozen hives producing, in the meantime, section honey. Extraction without apiaries may be considered in the future.

This work forms only part of the instruction given. The College possesses Agriculture and Farm Mechanics Laboratories equipped in a manner that it would be hard to equal. The recent expenditure in this direction has been over £300. With this intensive farm work on the College area in his first year and his experience on commercial farms in his second and later years, together with laboratory instruction in the basic sciences of agriculture, a pupil leaves us with a sound general training in the elements of his art.

A telegram of congratulation was sent by a clergyman to a bride on her wedding day. It ended: "See 1st John, ch 4 v 18." The verse in question is: "There is no fear in love, perfect love casteth out fear, etc." Unfortunately the telegram was received with the figure "I." omitted, this making it read: "See St. John, ch 4, v 18." The bride was horrified when she turned up the reference, for it reads: "Thou had five husbands; and he whom thou now hast is not thy husband!"

—E. Collins, T.2.

WHAT IS A KNOT?

A TERM VAGUELY UNDERSTOOD.

The term "a knot" is often understood by landsmen to be a measure of distance. As a matter of fact it is not a "nautical mile," as is commonly supposed, but a word used for the measuring of speed only.

A knot is a speed of one sea mile per hour. A ship is correctly reported to "steam 20 knots," or "to be steaming at 20 knots," but it is absolutely incorrect to write "20 knots an hour." A knot is not a length except on the log line. A statute, or land mile, is 5280ft (80 chains), and it is used for all land measurements. A nautical mile is 6080ft (equal to one minute of longitude at the equator), and it is used in all navigation calculations. It is incorrect to say, "it is 16 knots to Awaroa Bay." It is 16 nautical miles, but it should be unnecessary to use the word "nautical" as all distances by water are measured in terms of nautical miles.

ORIGIN OF THE LOG.

The earliest and most primitive method of measuring the speed of a ship was to tie a line to a log of wood, drop the wood overboard, and see how fast the line ran out. Later, the log gave place to a canvas bucket attached to a long line, which had its first mark at 100ft from the log ship, and counting did not begin until this stray line had run out. Beyond this the line was marked at prescribed intervals by knots and pieces of coloured bunting. At least once in every watch, two men were detailed to cast the log, to determine the speed of the ship, one standing by to give the time, while the second had the log. The shape of this canvas bucket kept it at rest in the water, acting as a sea anchor, and as the ship moved away from it the line paid out. As the rope passed through the hands of the man in charge of that part of the proceedings, the number of knots which ran out were noted, the different pieces of coloured bunting aiding him to note how many of them had passed. The number of knots which ran out in 28 seconds, measured by a sand glass, was the ships speed in knots. If ten of these pieces of bunting had run through the seamen's fingers in the 28 seconds, then the ship's speed was 10 knots. Owing to the system on which the line was marked and the relation of the period of observation to the full hour, the speed of the vessel in nautical miles per hour was equal to the number of knots run out on the log during that period.

The name "log" is still applied to all machines for measuring speed. Nowadays, the line is on a reel fitted with a brake, and the sand glass is replaced by a watch, and although patent logs have been invented almost in dozens, one principle is the same in all, although their details vary. Some sort of float is towed astern, having on it something like the blades of a propeller. As the ship proceeds, these revolve, and the number of revolutions measures the distance run out on a dial.

OLD SAILORS WATCHED THE LOG.

In the old days of the "fifties," when the tea clippers raced home from China with the first of the season's crop, or in the "eighties" when the wool ships from Australia and this Dominion "carried on" to be first Home, one can easily imagine the keenness with which the officers and men scanned the log at the end of each watch to note the distance run. Anxious eyes were also cast round the horizon to see if any of their rivals were in sight, in the hope of overtaking the

leaders, or in dread of being overtaken. Speed is an essential thing in ocean commerce to-day, and the perfecting of instruments to truthfully interpret it is a necessary adjunct to the safe control of any ship.

The old methods of determining this speed by the hand log may be practised perhaps occasionally during the run Home on some of the ships that now engage in the annual grain race from South Australia to Falmouth, but owing to the more modern methods available it is doubtful if much reliance would be placed upon the results. Nevertheless, the hand log is still a necessary item in a ship's equipment, and no surveyor will allow a vessel to proceed to sea unless one is included, and its markings are in their proper places. The British Board of Trade and our Navigation Act consider it expedient, and an added precaution against marine disaster, to retain some of the older methods of ensuring safe navigation, and many seafaring men would regret the severing of a link with the past if they were dispensed with.

—"Auckland Star," 22/6/34

RAW MATERIALS FOR PAPER.

With a few minor exceptions, all papers are made from either:—

1. Wood.
2. Esparto grass.
3. Rags.

In actual practice, of course, many papers are made from a mixture of two of these, but as there is always one which predominates, this fact can be ignored for the time being.

We will deal with esparto and rag papers first.

Esparto.—These papers are made from a tough kind of grass which grows in North Africa and Spain, and are to all intents and purposes only made in Britain, chiefly in Scotland. A few Continental mills make so-called esparto papers, but with very indifferent results. Writing papers made from this grass are clean looking and remarkably smooth and easy for the pen, while the printing papers are noted for their opacity and bulk—both being attributes which are very much desired. One of the few points against esparto papers is their lack of strength.

Rags.—These papers are made from rags, and, as even the quality of rags varies, there are many grades of rag papers varying in strength and shade, etc., according to the purpose for which they are required. Rag papers are always used where the strength of paper is an important factor, such as treasury notes, documents, etc., and all the best class letter-heading papers and ledger papers contain a certain amount of rag to ensure durability. Here again, all the best rag papers are made in England.

Wood.—The vast majority of papers are made from wood pulp, which is, as the name implies, pulped wood. The wood used is either pine or spruce fir, and as the forests in Europe are mainly situated in Scandinavia, Germany and Austria, it naturally follows that the majority of mills making wood papers are situated on the Continent, in most cases in close proximity to the forests and actual pulping mills. A large quantity of wood paper is made in Britain, chiefly for home consumption, though many types of it can also hold their own in the export market. A large amount of the wood pulp imported into this country is, however, not used for making wood papers alone, but is mixed with either rag or esparto to produce medium quality papers which are better than ordinary wood papers, but not as good as the very expensive all-rag papers.

ARTIFICIALLY SEASONED WOOD,

Old timber merchants will tell you that the subject of timber is never really mastered. New woods, new uses for woods, new by-products of wood and new treatments of wood are being continually discovered.

How many woodworkers, for instance, know that most of the timber being used to-day is artificially seasoned or dried? Yet such is the fact, and science has made so much progress in this direction that it will soon be possible for architects and others when ordering wood to specify the exact degree of moisture the wood is to contain. This would be an enormous advantage, and with new structures we should no longer have panels bulging, doors difficult to open and shut, drawers that will not slide, floor boards warping, and other little irritations which come with the change of atmosphere.

THE OBJECT OF SEASONING WOOD is to effect the expulsion, or drying up, of the sap which is left in it after felling, which would otherwise be liable to putrefy and cause decay. This can be done either "naturally" (i.e., piling the wood in an open or airy place and leaving it to season itself), or by the more speedy process of "kiln drying."

The demands of the Great War left this country—indeed, nearly the whole world—barren of naturally seasoned timber, and perforce much kiln-dried timber has had to be used. It is likely to be many years even yet before there will be anything like the quantity of naturally seasoned timber available which existed before the war The reason is that in the old days the market varied but little, and timber merchants felt safe in keeping large stocks to season; but since 1918 the market has, with the exception of one or two short periods, steadily dropped, discouraging enterprise and making merchants go warily.

The chief objects of kiln-drying wood may be enumerated as follows:—

(1) For quickness. This eliminates the necessity of sinking a large amount of capital in order to carry a huge stock on hand to season.

(2) To improve the condition of the wood for the purpose for which it is required.

(3) To reduce shipping weights (all timber shrinks in drying, and loses about 20 per cent. of its original weight) without waiting for the long time to air-dry or naturally season the material.

There is no standard method of kiln-drying wood, and the practice varies enormously. Even with the same species and for the same purpose all kinds of kilns and processes are to be met with. Temperatures the wood is subjected to vary from 60 degrees to above the boiling point. One inch boards, from one to eight months air-seasoned, are dried in from thirty-six hours to six weeks; thicker material from two to five months. Hardwoods are generally dried at a much lower temperature than softwoods.

KILN-DRYING is not so much practised in this country as in the United States, where it is a big industry, and the different processes include steam at various pressures, soaking in various solutions, drying in vacuum, in compressed air, in compressed air and steam, in alternating compressed air and steam, and even electrical treatment. In America, Sweden and Finland it is the general practice to pass all timber from the saw to the drying kiln. In America the planks are dried out completely by kiln, but in other countries the wood is only partially dried, leaving a certain amount of moisture in it,

The New Agriculture Laboratory. —By courtesy of "Auckland Star."

In this country a process of drying by hot air is largely favoured, and although it is slower than some of the other methods it is claimed that the "life" of the wood is not destroyed. But that is doubtful. However, by this method the hot air from an engine room is picked up by a fan and driven through a duct which runs to the floor or bottom of the kiln. Here it is allowed to escape through slots. Immediately above the slots are pipes heated by steam, so that in coming in contact with the pipes the air is heated still more as it rises into the timber, which is open-piled above. Every day a piece of the wood is taken out and weighed, and a note made of the weight. When it ceases to lose weight it is considered "done." The length of time it takes to bring it to this state varies according to the thickness and kind of wood. By this process it would take about three weeks to dry 1 inch of an oak plank 3 ins. thick. Natural drying would take about a year.

According to some experts timber is seasoned when it has lost one-fifth of its original weight, and is then fit for carpentry and ordinary uses, and suitable for joinery and framing when the loss of weight reaches one-third.

WHICH IS THE BETTER?—It is impossible to generalise on the question as to whether kiln-dried timber or that which is naturally dried is the better. Much depends on the purpose for which the wood is required and on the climatic conditions. For many purposes, such as use in heated buildings, small domestic articles, drawing boards, athletic goods, etc, air-dried, or naturally dried wood is not considered sufficiently dry, and kiln-dried material is preferred. But for constructional purposes it is generally agreed that, in this country, owing to the humid climate, naturally dried timber is better and more reliable.

To be able to season timber in a short space of time by artificial means, to "speed up" nature, as it were, is of course an immense advantage; but, as in all other cases where nature is cheated, it cannot be done without leaving a deleterious effect on the subject, and there can be little doubt that most of the life of the wood, if not all, is destroyed in the process. It has been proved that timber so seasoned will not stand nearly so much wear and tear as naturally seasoned wood.

The difficulty from the buyer's point of view is that there is no sure way of distinguishing kiln-dried timber from that naturally dried when examining planks. But those of us who are continually handling timber have noticed that kiln-dried wood often appears to be a little spongy on the surface. Naturally-dried timber, on the other hand, leaves us with an agreeable assurance of solidity.

—"The Woodworker."

COMMERCIAL ART.

Since the inception of the Commercial Art classes in the Evening School two years ago, their inclusion in the curriculum has been more than justified by steadily increasing attendances. Late in 1932 a beginning was made with a small class of eight students. This year the average aggregate attendance for the three weekly evening periods is approximately 60 students.

Working in conjunction with the lettering, design and typography classes, Commercial Art instruction seems definitely to be filling a want. The ground covered includes general commercial lettering, poster design, layout and showcard writing.

TIMBER IN USE FOR AIRCRAFT.

A MODERN DEVELOPMENT IN WOODWORK.

The recent contest for the Schneider Trophy has drawn attention to the unusual care which is taken in the construction of aircraft in order to ensure that they shall stand up to the most exacting tests. The evolutions of an aeroplane may submit the structure to exceptionally severe strains, and it is the business of the designer to make allowance for any possible circumstance.

Unlike most other forms of engineering the weight of the finished product is of such paramount importance that only a very small margin of safety is allowed over and above the failing stress of the material concerned. This margin varies according to the relative importance of the part, but generally speaking the maximum possible strength with the minimum weight is the golden rule. It can be readily seen then that, in such circumstances, the material used must not only be of the highest quality obtainable, but they must be rigidly examined and tested for possible flaws, any of which might endanger the safety of the machine and result in loss of life.

In spite of the fact that the trend of modern aircraft design is certainly towards all-metal construction, wood still forms a considerable part of the structure of modern aeroplanes and flying boats; and the foregoing remarks apply particularly to this material as it is much more susceptible to change of climatic conditions than metal.

Before any aircraft may fly it must first of all obtain a Certificate of Airworthiness. This is issued by the country in which the machine is registered and is only given if the authorities are satisfied that the material used is of the correct standard and that the necessary tests have been carried out. Accordingly the requirements laid down have been standardised. Information has been collected from various sources, and in consultation with the various designing firms specifications have been drawn up to meet the case.

THE TIMBERS EMPLOYED.

The woods used in the construction of aircraft are chiefly spruce, ash, mahogany, walnut and birch. Of these spruce is most largely used. It is strong, yet light and not liable to warp, and in consequence is used for main structural members. Unfortunately there is a difficulty in obtaining it in a greater length than 15 feet, but this drawback is overcome by splicing two pieces together. This is not detrimental to the work, as a properly spliced joint, well glued and bound with tape, may easily have an efficiency of 98 per cent.

Ash, being tough and flexible, is used where the timber requires to be bent, particularly when the material has to be steamed before being worked.

Mahogany and walnut are chiefly used for propellers, owing to their straight grain, though the former is also used in parts of the machine where its lightness and freedom from tendency to split are a consideration.

Birch is used in the manufacture of plywood, a commodity which owing to its lightness combined with strength, figures very largely in the construction of an aircraft.

In order to arrive at the strength of a specimen it is subjected to two tests, one to determine the modulus of elasticity and another to find its compressive strength.

ELASTICITY AND STRENGTH.

Elasticity.—The modulus of elasticity is determined by subjecting the selected piece to a bending test, and the compressive strength by applying a load axially on a short test piece.

Straightness.—In addition to this, special tests are stipulated in order to observe the straightness of the grain and to find the density and moisture content. The straightness of the grain in timber used for aircraft construction is a very important consideration, as a defect in this respect lowers the strength of the material.

It is, however, not difficult to test for this, although by no means easy to judge by visual inspection. A sample is taken and split with a blunt chisel in two directions at right angles to one another. Any defect in this respect can now be easily seen. A slight deviation of not more than twenty degrees from parallel is allowable.

Density.—The test for density is carried out by making use of the well-known principle of Archimedes, which states that a body immersed in a liquid loses weight equal to the liquid it displaces. A sample of the wood is weighed first in air and then in water, and the difference noted. Knowing the weight of any given quantity of water, the volume of the sample is easily obtained, and hence its density (which is, of course, its mass divided by its volume) is calculated.

The Moisture Content is also an important consideration, and the allowable amount depends on the use to which the particular wood concerned is to be put. If it is intended to be bent by steam treatment, it should not be seasoned or kiln dried. A sample is taken from the end of the plank selected and cut into thin strips. These are weighed and then placed in an oven at a temperature of 100 degrees centigrade, being kept there until no further diminution of weight takes place. The final weight being noted, it is a simple matter to arrive at the percentage of loss in weight. This is known as the moisture content.

PLYWOOD FOR AIRCRAFT.

Plywood.—No article dealing with aircraft timber would be complete without reference to plywood, which plays such an important part in the construction of the modern machine. In the early days of the industry this was used only for stream-lining, or what is known as "fairing," but nowadays improvements in the manufacture of plywood have enabled it to be used as part of the actual structure. The advent of the monocoque system of building the fuselage has brought this to the fore. With this method of construction the plywood is used to form a skin for the body of the aircraft, and as such is required to take actual structural loads in place of the wire bracing usually employed. This method is sometimes used in constructing seaplane floats and the hulls of flying boats.

Birch, ash, satin, walnut and mahogany are the materials sanctioned for use in the manufacture of three-ply, and of these birch is by far the most common. Special care is taken in the selection of suitable wood, which must be absolutely free from any dead knots or other flaws. The wood should not absorb moisture readily, as this causes the plies to open out at the edges. The several plies must therefore be well cemented together in order to minimise the tendency of the separate layers to part in use.

Tests For Plywood.—In order to test for this particular failing, a sample piece 6 ins. by 6 ins. is immersed in boiling water for three hours in the case of veneers up to 1/32 in. thick. For thicker material this time is extended to six hours. Afterwards the specimen should show no appreciable signs of separation at the edges, even when it is dried out again at a temperature of 70 degrees Fahrenheit.

Further stringent tests are applied to test the quality of the cement used. Two specimens are made up and kept for one month in an atmosphere saturated with water vapour. From time to time they

are examined to see that no deterioration has taken place, and after the stipulated period should not show any signs of separation at the edges.

It is obvious that only first grade material and good workmanship will enable the finished product to be pronounced satisfactory for aircraft use, and it is due to the thoroughness of the tests which are carried out to guarantee this high standard, and the infinite pains which are taken to eliminate possible failures, that aircraft to-day can be regarded as a reliable means of transport.

—"The Woodworker."

NOVEL HYDRO-ELECTRIC STATION.

A description recently given in the ASEA Journal, of the new Swedish power station at Sillre, makes interesting reading.

The installation is of special interest as it is one of the first to utilise surplus power for refilling its own source of supply. It forms one of a number of stations linked together to form a supply network. During periods of light load on the network the surplus power available is fed to the generator of this station to run it as a motor and drive a pump. By this means water is returned to the storage basin for use during rush or drought periods.

The generating portion follows ordinary hydro-electric practice. Water from three high level lakes is led through an almost horizontal tunnel one and a quarter miles long, into a steel pipe line five-eighths of a mile long, dropping steeply to the power station itself on the bank of the river, Indal.

The power station has been planned to contain three units, but is equipped at present with only one. This comprises one vertical three-phase, 50-cycle generator for 7,000 K.V.A., 6,600 volts. One vertical Francis water turbine developing 9,330 H.P. at 600 R.P.M., and 624ft. nett head. One centrifugal pump mounted under the turbine and on the same shaft as it and the generator. This is capable of delivering 85 cusecs (cubic ft. per second) against a total head of 624 feet.

It is intended to extend the station by adding a second set of about 9,000 K.W., with a pump, and possibly a third set of 2,500 K.W. without a pump.

The pumping portion is, of course the novelty. On holidays and at other periods of light load on the network, the turbine is disconnected from the pipeline, the generator is driven as a motor, and water from the river is forced back along the pipeline. In this way not only is energy economically stored for future use, but the load factor of the other stations on the network is kept high and their overall efficiency correspondingly increased.

Change over from generating to pumping is effected as follows. The drain and air inlet valves for the pump are closed, a circulating pipe from the pressure side of the pump is opened and the generator is disconnected from the line. The supply of water to the turbine is reduced till the speed falls to about 400 R.P.M. A valve on the suction side of the pump is then opened and water admitted from the river till the pressure has reached about 820 feet of water. Heating of the pump is prevented by allowing a small quantity of water to flow through the circulating pipe. The speed of the set is then increased to 600 R.P.M., and the generator synchronised in on the network. The discharge valve of the pump is next partly opened, the valve to the turbine closed, and flow commences back through the pipeline to the lake. With the pump fully loaded 6,500 K.W. are taken from the network.

Fig. 1.—Corrosion fatigue fracture under jet of wet steam, of specimen 0.5 per cent. carbon steel X115.
—From the "Journal of the Institute of Metals."

SOME RECENT DEVELOPMENTS IN ENGINEERING SCIENCE.

INTRODUCTION.

The increasing use of machinery at high speeds and high pressures and over wide ranges of temperature, has necessitated a clearer and more scientific investigation of the behaviour of the various metals and alloys available. It has also led naturally to the production of a wide variety of new alloys of both ferrous and non-ferrous metals. Consequently the engineer and designer in general must have a greater knowledge than heretofore, of the materials with which he has to deal. He must become familiar with the limitations as well as the advantages of the many types of metals at his disposal. The question of expense must also obviously be part and parcel of the question of expediency; and this entails a consideration not only of the initial cost but also of the subsequent expenses which may accrue due to the difficulties of machining, to heat treatment, and to the troubles possibly arising from heat treatment.

The following is a general resume of some of the more important branches of engineering experimental science which have received great attention during the last few years.

FATIGUE.

The so-called fatigue failure of metals is due to the repeated application of a range of stress which would be insufficient to cause failure after a single application. Fatigue depends more on the range of stress than on the stresses at the limits of the range. There has been definitely established a limiting fatigue range, called the "endurance range," below which failure does not occur even after many millions of cycles of stress. When the endurance range involves a complete reversal of stress each cycle, then half of this range is called the "endurance limit." Most fatigue tests on metals have been carried out to find this all important endurance limit. It has been shown experimentally that the ratio of this endurance limit to the ultimate static tensile strength lies between .2 and .5 for practically all metals.

X-ray crystal analysis by Sir William Bragg, Dr. H. J. Gough, of the National Physical Laboratory, and many others, has thrown much light on the subject of the failure of metals, and in particular, on failure by fatigue. By this means it has been definitely established that fatigue failure, as with almost all other forms of failure at normal temperatures, is a consequence of slip within the crystal grains themselves. As Dr. Gough says, "this rupture of atomic bonds then becomes a cumulative effect, with the result that the discontinuities of structure develop through the stage of microscopic cracks into that of visible cracks, which spread, under repeated stress cycles, in the well-known form of the creeping fatigue crack." Once slip has occurred, normal stresses, and even corrosive agents, may be powerful factors in accelerating the propagation of fatigue cracks.

As to what causes slip in the first place little is yet known. Modern theory seems to point to its being the result of a disturbance of the electronic distribution. It also appears possible that this disturbance of the arrangement of the electrons is the primary cause of the well-known strain-hardening which results from cold working, and which also inhibits the slip at the yield point in the ordinary static test.

CORROSION-FATIGUE.

The term corrosion-fatigue is used to describe cracking and fracture occurring in metals subjected simultaneously to a corroding

agent and to cyclic stress. The process begins with corrosion pitting under the influence of the initial stress. As pitting proceeds the actual stress rises, because of the increasing stress concentration at the bottom of corrosion pits. Eventually the actual stress exceeds the endurance limit and the metal is subjected to ordinary fatigue. Thus fatigue cracks start at the bottom of corrosion pits and proceed until the metal fails.

In a paper published in 1932, Dr. Gough gives the following as a list of service failures which have been "definitely and reliably traced to corrosion-fatigue action":—

Marine propellor shafts.
Ship's rudder main pieces.
Steering arms and stub axles of motor vehicles.
Boiler and superheater tubes.
Turbine rotors, discs, and blading.
Tramway and locomotive springs.
Various kinds of piping conveying corrosive liquors.
Flying wires of aeroplanes.
Pump shafts, pump rods, and pump bodies exposed to water.
Water cooled piston rods of Diesel engines.
Steel railway sleepers.

There is no definite endurance limit for corrosion-fatigue. If the cyclic stress is continued for a sufficiently long time with, say, ordinary drinking water running on the material, failure will occur at very low stresses.

The table below shows the tensile strength, endurance limit, and corrosion-fatigue limit for 10·8 cycles, of a few common steels and alloys. The figures are taken from a similar table appearing in a paper on "Stress and Corrosion," read by Dr. McAdam before the International Congress for Applied Mechanics, 1930. The high carbon steel was annealed, the nickel and Monel metal were low annealed, and the remainder were quenched and drawn.

Alloy.	Tensile Strength lb. per sq. in.	Endurance Limit, Rotating Cantilever, lb. per sq. in.	Limit for 10^8 Corrosion Fatigue cycles, Rotating Cantilever, lb. per sq. in.	
			Fresh Water	Salt Water
0.16% Carbon Steel	65,700 ± 1,200	35,000	20,000	7,000
1.09% Carbon Steel	103,400 ± 4,100	42,000	21,000	—
3.7% Nickel Steel	128,100 ± 2,800	64,000	22,000	—
Chromium Nickel Steel (3.26 Ni., 1.55 Cr.)	162,200 ± 1,700	89,000	—	—
Steel (.88 Cr., .14 V. Chromium Vanadium	160,600 ± 4,700	69,000	17,000	—
Stainless Steel (.88 Ni., 14.5 Cr., .07 Cu.)	178,100 ± 1,900	88,000	32,000	—
Nickel (Cold Rolled)	131,700 ± 2,700	50,000	25,000	23,000
Monel Metal (Cold Rolled)	127,200 ± 1,000	52,000	24,000	28,000

The following table compiled by Dr. Gough in 1931, gives some figures which should be of decided practical interest:—

MATERIAL.	Temperature Degrees C.	Short Time Ultimate Stress Causing Fracture in about 10mins. Tons per square inch	Stress Causing Fracture in about 5 days Tons per square inch	Stress Causing Fracture in about 25 days Tons per square inch	Rate of 10.5in. per in. per day ot the end of about 40 days. Stress Producing Creep Tons per square inch
Nickel Chromium	400	38.5	24.0	21.0	7.6
Steel (Ni. 3.53,	500	27.5	9.0	7.0	1.5
Cr. 0.24, C. 0.31%	600	27.5	3.0	1.6	0.4
Stainless Steel	400	38.0	31.0	28.0	19.5
(Cr. 13.7,	500	31.0	14.5	13.0	4.5
C. 0.29%	600	20.5	5.0	3.5	0.3
Duralumin	150	21.6	17.0	14.5	9.4
	250	10.5	5.0	3.7	2.5
	350	3.3	1.4	1.2	0.6
Brass (60:40	150	23.2	21.0	19.0	9.0
	250	17.8	7.0	4.0	0.4

Dr. Gough has suggested that, as a basis of design, the stress which causes rupture after a given number of cycles might be used. For this purpose he gives the values set out below:—

ALLOY	Ultimate Stress Tons per square inch	Endurance Limit Tons per square inch	Corrosion Fatigue Limit Salt Spray —Reversals to Fracture			
			10^7 Cycles	2×10^7 Cycles	5×10^7 Cycles	10^8 Cycles
5% C. Steel	63.2	±24½—25¾	± 5.0	± 3.9	± 2.8	±2.2
15% C. Steel	43.3	±24¾	±11.2	±10.3	± 9.1	—
18/8 Cr.Ni. Steel	66.3	±23¾	±17.5	±16.7	±15.8	—
Duralumin	28.2	± 9½	± 4.5	± 4.0	± 3.4	±3.0

MECHANICAL PROPERTIES OF METALS AT HIGH TEMPERATURE

The study of the properties of materials at high temperatures has been of considerable importance in recent years, mainly because of the development of internal-combustion engines and chemical apparatus, and later still of high pressure and high temperature steam plant. For instance, boilers are now working at pressures of 1,000lb to 3,000lb per sq. in., and a group working at pressures above 3,000lb per sq. in. in the the vicinity of the crictical pressure are being experimented with. And it should be noted that, at pressures of 1,000lb and 3,000lb per sq. in., the saturated steam temperatures (and, therefore approximately the metal temperatures), are about 550 degrees and 700 degrees F. respectively. In an aero engine exhaust valve the temperature may be as high as 1,100 degrees C. Again, a great deal of machinery is now running at greatly increased speeds, and with far

less clearance between adjacent parts. A striking example of this is given by the steam turbine motor, where the blades revolve in superheated steam at about 3,600 revs. per minute with a clearance of one-thousandth of an inch.

A material under test at a constant stress but at a high temperature will continue to flow or elongate till fracture probably occurs. This phenomenon is known as "creep." Note that the stress may be much below the normal breaking stress. One can realise quite readily the risk of serious accident that such an elongation introduces into the working of the above turbine motor. Exhaustive experiments, combined with practical experience, have shown the necessity for the defining of a limiting creep stress, to cover such cases. This limiting stress is usually taken to be that stress below which creep, if once set up, will gradually die out or will at least result in a creep rate not exceeding an amount permissible by the working conditions. A creep rate of 10-5in. per in. per day has now almost universal acceptance. On the other hand it is said that for certain turbines, etc., a creep rate of 10-8in. per in. per day only is permissable. Where an exact knowledge of the actual deformation in service is not required, a working stress is now often chosen by dividing the limiting creep stress by three. This value is then in general below the limit of proportionality, and ensures that the deformation will be very small.

The rate of loading of the material in a tensile test has no appreciable effect on the results at normal temperatures up to about 300 degrees C. However, above this temperature a slow rate of loading may result in a drop in tensile strength of as much as 75 per cent. Thus, we see the inadequacy of the short time test as carried out in most laboratories, or at least in practically all workshops, to give reliable results. Highly sensitive machinery, with an accurate temperature control, must be used.

The nature of the fracture at high temperatures is also a section of the subject of serious moment. Whereas at normal temperatures fracture is of a transcrystalline nature and is preceded by considerable deformation, at high temperatures the fracture tends to become intercrystalline, with a resultant decrease in grain formation and, therefore, of total elongation. In other words, the material tends to become brittle. Bailey and Roberts in a paper read before the Institution of Mechanical Engineers, 1932, state that "the phenomenon of embrittlement is generally negligible in carbon steels, but has considerable importance in certain alloy steels, and particularly the useful ranges containing 1.5 to 3.5 per cent. nickel, or 1 to 2 per cent. manganese." It is suggested that, where steels are required for use at high temperatures in parts subjected to important stress, and where there are sharp changes in contour, such as in studs and bolts, tests for embrittlement should be specified.

Little is known as yet of the subject of fatigue at high temperatures. The possibility is that the creep rate will be increased by the superimposing of a small range of alternating stress on a static load at high temperature. However, the present position seems to be that design should be guided primarily by creep stress data.

Again the question of initial heat-treatment must receive consideration, and research seems to indicate that it has a very great influence on the creep rate. Work is, therefore, being carried out at the N.P.L. and elsewhere, on the comparative creep resistances of the same steel in various forms of microstructure—normalised, spheroidised, water-quenched and hardened, etc.

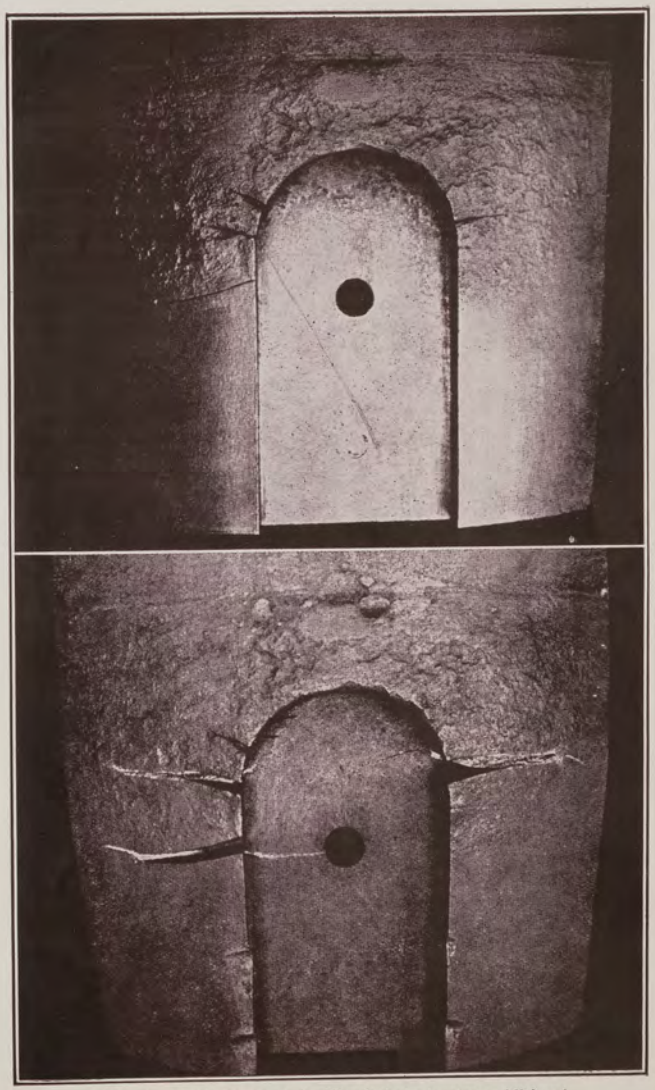


Fig. 3.—Same shape as in Fig. 2, but showing additional corrosion fatigue cracks revealed by bending shaft.

Fig. 2.—Tail-shaft failure due to sea-water evading rubber sealing ring.

—From the "Journal of the Institute of Metals."

CONCLUSION.

It has been stated on good authority that at least 80 per cent. of the failures of machine parts to-day are of the nature of fatigue or corrosion-fatigue. In addition, the trend of engineering practice is in the direction of intensifying this trouble unless preventative measures are taken. This does not necessarily mean that when, for instance, mild steel fails, a stronger and perhaps more expensive steel should be substituted. In many cases failure is due to the application of avoidable stresses. Thus, we have excessive reversed bending stresses on shafts caused perhaps by improper alignment of connecting shafts, through out-of-balance of fly-wheels, or through unsupported parts attached to the ends of the shafts. Failures due to torsional fatigue, particularly where keyways seriously increase the concentration of stress, are also common.

On the other hand, if it is finally decided that a new material must be used, care should be taken to make the most suitable choice. For instance, while the higher carbon steels give greater resistance to wear and have a higher elastic limit and fatigue strength, they are much less ductible, and will not therefore relieve overstress by deforming as will a mild steel.

For parts subject to heavy shocks or to a large fatigue range, a nickel or nickel-chromium-molybdenum steel is recommended. This latter alloy steel is most generally used in a condition giving a tensile strength of from 55 to 60 tons per sq. in., and an impact value of not less than 60 ft.-lb. It is a particularly useful steel for automobile frames, high tensile bolts, and shafts in general. In automobile rear axles, where reduction of weight is imperative, this steel is used in the 85-90 tons per sq. in. condition, with an impact value of 30-35 ft.-lb.

It is worthy of note that very few nickel-chromium steels are now manufactured without the addition of from .2 to .6 per cent. molybdenum. This element has a very marked effect on the general usefulness of the steel. In particular, it results in the disappearance of "temper brittleness." It has also been found that the addition of 0.5 per cent. molybdenum to a low carbon steel gives considerable improvement in resistance to creep. It is, therefore, possible that a steel of this type may become of increased importance in modern engineering construction.

Types of alloy steels which may be recommended for use in the presence of corrosion-fatigue, or corrosion and any form of high stress, are, (1) the 12 per cent. chromium steel as originally invented for cutlery, etc., (2) the well-known 18/8 chromium-nickel steel which is much more resistant to corrosion than (1) and has much more satisfactory physical properties, (3) the 18 per cent chromium steel which has good physical properties, and is particularly suitable in parts subjected to electrolytic attack due to working in contact with bronze brushes, etc.

For temperatures round about 1,,000 degrees C. it has been found that the original chromium and nickel-chromium steels can be greatly improved by the addition of varying quantities of silicon, titanium and tungsten. Probably the most arduous duties that a steel has to undergo —involving resistance to high stresses, high temperatures, corrosion and wear—are those encountered in an aero engine exhaust valve. Here silicon-chrome and nickel-chrome-tungsten steels have to be used.

In conclusion one might point out that design in practice is being greatly restricted at the present moment by the necessity for finding a material economically suitable for superheaters, high-pressure

turbines, etc. Superheat temperatures beyond 850 degrees F., are an unsound proposition commercially. As Davis and Timmins state in the Proceedings of the I.M.E., December 1933, "The production of metal having the necessary qualities to facilitate manipulation and to resist steam temperatures of the order of 1,000 degrees to 1,200 degrees F. in the presence of correspondingly high gas temperatures, would have a marked influence on economic boiler pressures, which might be expected to attain 1,200 to 1,400lb per sq. in., or even higher on the simple expansion cycle."

Obviously still further research is called for before finality will be reached on many of the above questions.

METALLURGY.

The evening classes in metallurgy commenced in 1933 are now well established and have proved extremely popular. While only the briefest outlines of this subject can be investigated in the time available, many problems of great importance relating to the production, characteristics, use and maintenance of the commoner metals are studied and subsequently, in the more advanced stages of the class, experimentally verified. Those taking the course in metallurgy, are introduced to metals from an aspect previously unapproached by them, and the peculiar behaviour and inherent tendencies of metals to react according to their kind, are studied. How these tendencies may be, or have been, turned to commercial advantage, are investigated as far as possible, and a sound working knowledge, that finds its immediate application in the garage and workshop, is obtained.

Man's insatiable desire to penetrate Nature's secrets manifests itself once again in the importance in which the applied sciences stand to-day. Moreover, the present collaboration of investigators of widely differing views, nationality and resources, has led to a general pooling of new knowledge of the applied sciences that has made for their better understanding and their further development and application in industry, has reacted favourably to man's profit and comfort.

For many years it has been known or surmised that metals were, essentially, aggregates of more or less minute crystals (like so many grains of sugar) held together perhaps mechanically, or by some kind of cement, or by some process analogous to chemical affinity—indeed, even by a system of so-called crystallites. The study of such fundamental characteristics in metals (including alloys), has been pursued with increasing vigour during recent years, the microscope and X-rays featuring conspicuously in modern research. Our present conception of metals, however inadequate, is far in advance of what it was a decade or so ago, inasmuch as established facts have so largely replaced conjecture in specific instances. Characteristics hitherto dimly surmised or perhaps totally unsuspected, have become manifest as unvarying constants of the deepest significance, and industry has been quick to apply this newly-acquired data. The Great War was a means of stimulating research in metals, and although, no doubt, serious setbacks have been experienced, especially in mechanical and aeronautical engineering, the searching test of use in service has since not only modified conclusions arrived at, perhaps hastily, about that time, but also confirmed that the expectation of unique mechanical properties was entirely justified.

Progress in the physical improvement of metals has been largely retarded by the paucity of our knowledge of their elementary inherencies. For centuries, metals of widely differing mechanical properties have been won from identical ores by identical conditions of production. But the systematic application of the microscope during the last twenty years, has probably done as much to explain this irregularity as the crude, though commendable, explanatory methods of the previous two thousand. Our knowledge of optics, of electricity, of radio-activity—to mention only three—has enabled high temperatures to be produced, controlled and accurately recorded with the utmost ease. To-day, by means of "refined" methods, metals of surprising mechanical consistency are produced on repetition. To-day we know that the seat of all metallurgical phenomena is located in the crystalline aggregate, the control of which means the control of the mechanical properties of the metal.

Artificial means are available for controlling the crystalline aggregate, and these include the addition of heat to or subtraction of heat from the mass, and alloying to both integrate physical characteristics, or to act as a physic. The sciences have disclosed how the pure crystalline structure should, or does, respond to heat, and the peculiar influences of a juxtaposed alloying element, but the reasons why are still a matter of much conjecture, occupying the attention of the most eminent metallurgists at the present time. The pursuit of this phase opens an avenue of inquiry of absorbing interest, and perhaps one more profound than any other in the whole of metallurgical philosophy.

ACROSTIC.

My first is in College and also in School,
My second's in pond and found too in pool,
My third is in Mother and yet not in Dad,
My fourth is in merry, but not found in sad,
My fifth is in sewing, but never in stitch,
My sixth is in rut and yet not in ditch,
My seventh's in Arithmetic wherein we excel,
My eighth is in fingers with which we type well.
My ninth is in Shorthand as well as longhand,
My tenth is in hols. from which we are banned,
My next is a number—'tis the third one—that's three;
My last is a letter—we shout it with glee,
My whole is the best form in S.M.T.C.

—R.H., Com. 3A.

Water is composed of two gins; Oxygin and Hydrogin. Oxygin is pure gin, Hydrogin is gin and water.

HOUSEHOLD FABRICS.

TESTS AND USES.

We use materials for such a variety of purposes in the home that they need to display many good properties—strength, ease of laundering, warmth or coolness, smoothness or roughness—all depending on the use to which they are to be put.

Since there are practically only five fibres from which the fabrics of the household are manufactured (viz., wool, silk, cotton, linen, the natural fibres, and Rayon, the "man-made" one), if one has a knowledge of what are the properties and peculiarities of these fibres then it is a valuable guide in the choosing of materials for our particular purpose.

Besides the properties which make them particularly valuable for certain purposes, these fabrics have also chemical properties, and because these differ, we can use some simple tests on samples of materials and so make sure that the fibre used is what it appears to be, and that we are buying genuine silk and not artificial or loaded silk, and all-wool instead of cotton-and-wool mixtures, and so on.

Cheaper fibres are often so treated that they resemble the more expensive ones in appearance (though they seldom possess such good wearing properties), and a knowledge of these tests may save our pockets considerably.

If we remember their origin, it gives a clue to the first of these fibres. Those that come from plants, viz., Linen, Cotton and Rayon, burn with a flame, and burn completely to an **ash.** There is no smell. Those that come from animal sources (wool and silk), burn much more slowly—in fact wool merely smoulders, and instead of an ash, a black gummy "bead" is left. There is also a smell of "burning feathers or burning hair."

The burning test, when applied to silk, also tells us whether it is pure and free from loading, or whether the fibres have been stiffened with mineral salts, etc. A loaded silk thread, after burning, **retains the shape of the thread,** and does not form the bead. This is, of course, because the mineral salts that were used to fill out the material are not inflammable. Silk, such as some taffetas and the old style of moire silks, are often heavily loaded, and consequently split and crack very quickly at the folds, often indeed, before they have been worn.

The method of using the burning test is to unravel a few threads each way—that is, from the "warp" or long way of the material, and from the "filling" or crossway of the material, and to burn them separately. It is necessary to test both threads, as very often fabrics are a mixture of two types of fibre.

The knowledge that cotton burns readily and wool does not, besides being a reliable test, is also of value in that it guides us in the choice of fabrics to be used where they might possibly be set alight by sparks, etc.

Thus cotton fabrics with a soft fluffy surface, such as Flannelette, are veritable tinder, and for children's night-clothes are not nearly as safe as **woollen** ones. Some flannelettes are treated with chemicals to make them burn less readily, but these usually wash out after a short time.

Distinction Between Animal and Plant Fibres.

Having burnt our sample threads, it remains for us to distinguish between the two animal fibres, Silk and Wool—and the three Plant fibres. Silk and Wool have very little in common in appearance, so that to distinguish between them is no difficulty, but we shall for all that learn a few characteristic tests that show their properties.

Wool always feels warmer than any of the other fabrics, while linen feels coolest. When wool is creased between the fingers and thumb and then released, no crease is left, as is the case with cotton and linen. This is due to the elasticity of the wool—a most valuable property which enables it to resist hard wear. Pure silk is also very elastic, and one way to distinguish between silk and rayon, is to take a handful of the material, and after crushing it tightly, open the hand. The silk springs out and usually slips from the hand uncrushed, whereas the rayon remains crumpled and opens up only a little.

Wool can absorb a tremendous quantity of water without feeling damp, whereas all the other fibres dampen much more quickly. This test is often used to distinguish between woollen and cotton blankets. When a damp finger or a damp cloth is wiped rather firmly across the surface, the woollen "nap" remains practically as erect and fluffy as ever, but the cotton "nap" remains flattened. This test is rather valuable as it can be done on pieces of material which have no raw edge, and so cannot be unravelled for the burning test.

The moisture test is also used to distinguish Cotton and Linen. Linen has a very rapid absorbent action, and if a drop of water or oil is put on each of linen and cotton, it will spread much more quickly through the linen, while it will take some appreciable time to soak into the cotton.

Linen also dries more quickly than cotton. For both of these reasons it makes better towelling than cotton.

Another test to distinguish between cotton and linen is to tear a piece of each. The torn edges of cotton turn up, while those of linen lie flat. For the same thickness of material, linen is stronger than cotton and harder to tear, and consequently wears better. Linen is also smoother than cotton, which has little fluffy hairs except where it has been "dressed." As is the case with weighted silk, cotton can be treated so that it appears to be more closely woven, firmer, and of better quality than it really is. We can detect this by tearing the fabric; if the material has been weighted, a fine white dust will fly out. (The material may be rubbed briskly between the thumbs and fingers instead of being torn.) Practically all cotton materials contain a little stiffening, and this is allowable as it helps in the weaving and enables the fabric to remain clean for a longer period. Heavily filled materials, however, are not to be recommended, as the heavy filling disguises a very inferior quality material.

We have mentioned "Rayon" several times. We are all of us now familiar with the name, but some of us may not be quite sure what it is. This is the name of the "man-made" fibre that is so much in evidence nowadays. This fibre was originally intended to be a substitute for silk, and received the name of "Artificial Silk." But it resembles silk in nothing but the lustre, and has many properties of its own, so the name was considered to be deceiving, and so the fibre was renamed "Rayon" and now stands or falls on its own properties, and not on its success as an imitator of silk.

It is prepared from wood pulp and cotton waste, and so gives the cotton burning test and can thus be distiguished from silk. Celanese is prepared somewhat differently, and so does not burn so readily as the other rayons.

As rayons dye readily, we can procure them in a wide range of beautiful colours. They have also a brilliant lustre and are cheap, but they have the disadvantages of crushing very badly, of being weakened by moisture and less strong when wet than when dry—while heat,

such as that from a hot iron or boiling water damages them very much. Their power of absorbing water is very low, and it always "feels" cold.

Why Fabrics are Valuable.

also to know something about the weave and how it will look and wear. We need in most cases a firm weave, with few floating threads, because these are liable to become rough and frayed, particularly in the case of rayon. Also when threads are of different thickness in warp and weft, the thinner ones soon wear through. To test the firmness of the weave, take material between thumbs and fingers and pull in opposite directions. Test both ways. A well-woven material should not "give" or the threads pull.

Now let us see how our consideration of the properties of the fibres, and the soundness of the weave can influence us in the direction of wise and economical buying of household linen.

Practically all "Linen" requires thorough laundering, and so we make our choice between cotton and linen for bed-linen, table-linen, towels, etc.

We have also to determine whether such "linen shall be white or coloured."

But the value of a fabric for any purpose does not depend alone upon the suitability of the fibres of which it is composed—we need

As everyone has had much practical experience in choosing linen, no attempt has been made to deal with the whole subject, but a few notes are given.

SHEETS.—Linen is smooth and cold, but crumples readily. It looks "good," keeps clean, and "lasts a lifetime." Cotton is less smooth, less cold, and crumples less, but it becomes soiled more quickly and lasts a shorter time. It is much cheaper than linen.

PILLOW CASES.—Linen ones are nicest, since they are smooth, cool and clean.

TABLE LINEN.—White linen damask is the ideal, but is too expensive and requires too much laundering for the average home. It washes and launders beautifully and requires no starching.

Good cotton damask is often better than cheap linen of the same price. Coloured cotton cloths are now popular, but they have the drawback that the removal of stains and spots removes the colour also. They are inexpensive, however, and the cost of renewal is not great. They make the breakfast table gay and are quite suitable. The choice between linen and cotton is chiefly determined by the "pocket."

TOWELLING.—Linen absorbs and gives up water more quickly than cotton. Unbleached linen towels are rough and stimulate the skin to glowing health. Expense is a factor.

Cotton absorbs water more slowly. Double looped terry towels expose a large absorbing surface to dampness, and are soft to the feel.

Cotton can be made to resemble linen so closely in appearance that it is often difficult to tell just what materials are pure linen. The water test helps. If there is a possibility of the material being cotton one way and linen the other, if the threads be unravelled they can be compared. Cotton is dull and lifeless—linen lustrous and stiff.

BLANKETS.—In New Zealand we use woollen blankets and it is the ideal fibre, being light, soft and warm. All blankets made in New Zealand are "All Wool," though some imported ones may contain a certain amount of cotton. This can be detected by the nap moisture test, and by examination at the selvedge.

VIRUS DISEASES OF PLANTS.

SYMPTOMS AND MEANS OF CONTROL.

These diseases include all those which may not be due to the attack of a parasite but appear to be largely environmental. They are frequently regarded as "physiological" resulting from a derangement of the life processes of a plant. They are peculiarly infectious, the "contagium" or "virus" being carried in an unknown form in the cell sap.

The symptoms are, in general, mottling of the leaves, chlorosis or absence of green colouring matter, distortion, dwarfing and necrosis or death of tissue (rot, wilt, damping off, etc.). The mottling suggests the term "mosaic" as applied to potatoes—one of the earliest types of virus disease studied.

The earliest work, on tobacco mosaic, was done by Mayer in 1886 and since then the list of host plants has constantly increased. The Solanaceae (potatoes, tomatoes, tobacco), are particularly susceptible but virus disease has been observed in the Rose family (Rosaceae), Curcurbitaceae (marrows), Legumes or Clovers, Carrots, Composites and grasses, etc. The mottling, dwarfing and distortion are easily distinguishable.

Several theories have been advanced regarding the cause of virus diseases, some physiological and some parasitic. The contagious nature of the disease seems to suggest the parasitic origin, some micro-organism bacterium or protozoa, which so far has not been isolated, being the cause. The unbalanced nutrition theory as a result of work by Mayer in Europe on mineral elements of food in relation to the disease, by Woods on the available nitrogenous reserve food, and finally by Freiberg is not widely accepted. Woods maintained that the upset of the nitrogenous reserves resulted in an abnormal production of oxidizing enzymes, but a later worker, Allard proved that certain of the enzymes are certainly not responsible, and strongly maintained the bacterial origin of the disease particularly because of the infectious nature of the disease. So far, no bacteria has been isolated that can be related to the disease. In 1921 Kinkel described small bodies found in mosaic-infected cells and similar results were given by McKinivey, Eckerson, and Webb in 1923 and by Eckerson in 1926, but so far, although of interest, these protozoan theories are not conclusive. The unbalanced nutrition origin, the enzyme, bacterial and protozoan theories having failed so far to become established, it remained to suggest a "virus" theory, really a cloak for ignorance, a virus being something that causes a disease.

It is quite certain, however, that virus disease is carried in the cell, say by such agencies as insects, aphis, hands (to a limited extent) pruning shears, etc. Control depends on this fact and upon the fairly well accepted statements that the disease does not survive for long in the soil but may be transmitted in the seed. The main methods of control are:—

(1) Use seed from stock known to be virus free. Use only healthy seedlings.

(2) Spray to control such insects as aphis, although the spread through this agency may not be great.

(3) If virus is present, allow a fortnight between prunings of such plants as tomatoes and always work with healthy plants before touching those affected. Wash the hands when touching healthy crops after handling affected tomato, tobacco, or cape gooseberry.

(4) Remove and burn all plants and roots of affected plants at the end of the season. If only a few are affected during the season, remove and burn these.

THE PROGRESS OF THE MOTOR CAR.

The world to-day is experiencing changes in many directions, and there is good in every one of them, if only we can see it. Take for instance the motor car. I suppose nowhere has there been such transitions, from ideals which, when first introduced, were considered the last thing, or from what might be termed accepted practice. Nor must it be suggested that either the end or the limit of these changes has been reached, or that all the ideas brought forward have been incorporated in the present day car. Ideas beget ideas; other brains obtain a somewhat similar result by another method; and so it goes on, always progressing. Surely this is an encouragement to any man or boy to develop and bring out any new ideas he may have. The only stipulation is that the idea must be good enough to hold its own against the competition of thousands of other ideas. It may perhaps be ousted by a still better notion; such is progress.

Has any mere owner-driver any conception of the colossal changes necessitated in the manufacturing organisation by including any new design in a car? Frequently it means completely demolishing the existing plant to instal new machinery giving new methods of manufacture, more accurate work, and a saving of time. It may be costly, but still it is progress.

No one man has all the brains, and so it is we find all manner of suggestions brought forward, many of them ideal for the work in hand. Because a man's invention does not meet with the instant approval of designers, there is no reason why he should be discouraged. Perhaps his work might mesh in better in another sphere of which he is not aware, or perhaps the time is not propitious for his ideas. There is an outlet for his ingenuity somewhere if only he can locate it.

One of the outstanding additions to the modern car is the individual suspension of the front wheels. Designers were driven to use it because of the popular demand for more and more speed, for more comfortable and steadier riding, and because of latent faults in the old method of suspension. You and I have always been used to things acting together in unison; now we have to accommodate our minds to wheel units acting independently. A new conception, but still it is progress. A point to be noted here is that, in the best systems "camber and caster," as well as "toe in," are all independently and easily adjustable—a thing which was not possible in the old system. Now, how many men had head and heart aches in the days before the 1934 models were brought out? Even as far back as 1905-1907, there were such pioneers, striving with independent wheel suspension, and it is to such that we should give a more sympathetic encouragement.

There is scarcely a part of the engine in which we cannot note this progress. To mention pistons; the new conception of cam ground pistons, or cylinder liners of smooth, glass hard steel, or valve inserts of similar metal, or the rather revolutionary idea embodied in the new "floating power" method of engine suspension, is to mention but a few of the progressive steps to which motorists and engineers have had to adjust themselves. It has been well said that the modern car is practically self-steering, and who knows, but that in the near future, they will be something like the large battleship which was used as a target for gun practice, being controlled from afar wholly by wireless. You question the pleasure of such motoring, but I suggest then, the driver also will be able to enjoy the trip—more progress.

On the electrical side, what with all the automatic devices, the wireless installation, and so on, the layman is likely to become slightly dazed, and yet I must not convey the idea that everything is more

Unpropitious weather at the Annual Athletic Sports. —By courtesy of "Auckland Star."

complicated, because the opposite is really the case. That everything is foolproof and straight forward in operation, can as well be said of the rest of the car as of the electrical side.

Doubtless, one of the most fascinating parts of the car is the transmission, more especially the clutch and the gear box, and, as might be expected, it is here that great changes have been, and are being made. It is here, especially that what I said earlier applies, about different men achieving similar results by different means; imagination and ingenuity have run riot. First, we have improvements severally in clutch and in gear box, in the clutch generally, and in the gear box, with synchromesh and helical gearing. At the same time came free wheeling. Then came many interpretations of progress in the clutch; improved and automatic friction clutches, many of them quite ingenious; some operating by themselves, and others interconnected or controlled by vacuum or accelerator pedal. As if these were not enough, there had to come to light, at this time, two other types, the Wilson self-changing, planetary transmission, and the Fluid flywheel, associated with the name of Daimler. These were new ideas to the general public, and might I add, not readily understood, but they were not new to their founders.

Previous to 1898, Major W. G. Wilson, C.M.G., had been interested in the designing of a motor car, and a little later resolved to improve on the "somewhat brutal" clash type of gear box, introduced by Panhard, and generally accepted by the majority of the automobile industry. The result of his labours was an epicyclic transmission, which gave quite good service, and was probably the inspiration of the transmission used later in a world-famous car. About the time of the outbreak of war, this man was given the problem of designing the land ship or tank, and, in solving the difficulties of evolving a transmission which would stand up to this type of work, he laid the foundation of what, some years later, turned out to be the self-changing and self-adjusting gear box, we now hear so much about in modern cars. He reduced the size to suit requirements, and presented the motor industry with what was hailed as one of the biggest strides in the progress of the automobile.

Now for the Fluid flywheel, as we call it. Its designer called it a "torque converter" when he brought it out, and he intended it for a far different purpose. In 1902 Sir Charles Parsons created the first large steam turbine installation for ships, and this developed its power at high speeds. The problem was to transmit this power, but at reduced shaft speed, without undue loss. Many engineers tackled the problem, most of them via electricity or gearing, but a Dr. Frottinger had ideas about hydraulics, and he proceeded to apply his ideas to work out his problem. After numerous trials lasting over some years, he perfected and patented his "torque converter." It was first practically applied in smaller steam-driven vessels, transmitting some 500 h.p., and then in Channel steamers, and later in cruisers. In these latter it transmitted over 45,000 h.p., with an efficiency of 91.3 per cent.—how is that for progress? The firm of Daimler became interested, saw opportunities of improving their car, by including this "torque converted" or "fluid flywheel." We can call it a fluid clutch if you like, because it acts as a wonderfully automatic clutch, even though it was not designed as such in the first place.

In conclusion it may be observed that there does not seem to be a problem which cannot be solved, and it behoves any boy or man who has in his blood the slightest spark of an Edison, a Marconi, a Royce, or any others of the legion of great inventors, to have heart and courage, to persevere, and contribute his portion to the ever-running river of progress.

A GROUP OF GARDEN PESTS.

The four insect pests described below are of considerable economic importance, and their destructiveness may be regarded as typical of that of four of the agriculturally most important insect orders.

CARROT FLY (Psila rosae).

This small fly, introduced during the past few years into New Zealand, is a serious pest once established, and a severe infestation may completely ruin a carrot crop by the insects' tunnelling into the roots and causing the characteristic "rusty" appearance.

Description.—The **adult fly** is shining black, with rusty-coloured head and black or red eyes. The legs are yellow and the wings iridescent with yellow veins. Its length is about 1-5-inch, and its wing-span nearly ½-inch. The **maggot** or larva, about ¼-inch in length, is legless, yellowish, and tapers to a point at the head. The **pupa** is similar, but inactive, being pointed at the head and of a light-brown colour.

Life-History.—The flies appear in spring and lay their eggs just below the surface of the soil. These hatch in from 6 to 12 days, and the maggots eat their way downwards through the root. After about four weeks the larvae emerge and pupate in the soil. There are at least two broods a year.

Control.—(1) The only practical preventive measures are to sow the main crop after the first brood has been noticed. (2) Dressings of such materials as napthalene (½oz. to the square yard), ashes, paraffin oil, lime, and soot, have been recommended by English authorities. (3) Rotation of crops. (4) Preventive methods such as pulling infected plants indicated by yellowed leaves, and in limited areas, watering after thinning, and consolidating soil, to prevent egg-laying.

THE GRASS GRUB AND BROWN BEETLE (Odontria Zealandica).

There are 20 species of Odontria, all belonging to the cockchafer family of Melolonthidae, and all fairly similar in appearance and life history. They form a genus indigenous to New Zealand, and they have, as destroyers of pastures in the larval stage and of tree foliage as beetles, forced their unwelcome attentions upon both farmer and orchardist. O. Zealandica is the commonest species, but O. striata, a larger, darker beetle, is common in some localities.

Description and Life History.—The **adult** of O. Zealandica is a brown beetle, nearly ½-inch in length, with short elytra or wing-cases, and appearing in swarms chiefly in November and December. It is a nocturnal flier, preferring calm, dull nights, and sheltering, inactive, during the day. The damage done in this stage consists of the destruction of the foliage of fruit trees and of young cruciferous crops, such as turnip and rape, especially in the seedling stages.

The **eggs,** which are laid in the soil at the base of the stems of host-plants, hatch in from 9 to 11 days.

The six-legged **grub** is ½-inch in length, creamy-white, with a brown head, and is doubled-up like a U. It feeds throughout the year on the roots of grasses, causing characteristic brown patches in the sward, rests during June and July, burrowing down for as much as a foot into the soil in cold weather, and pupates in September, emerging mainly in November and December to continue anew the yearly cycle of depredation. The main damage is done in August and early September. As the grub loosens the soil by passing it through its body, it further prevents the damaged roots from obtaining a sufficient supply of moisture.

Control.—Connel (1933) gives the following methods as suitable for the control of this pest:—

(1) By topdressing and by trampling by means of feeding out hay, etc., the roots are stimulated to fresh growth.
(2) Leaving land as bare as possible in November and early December, to discourage egg-laying.
(3) Fruit trees are sprayed with arsenate of lead, and this is also dusted on lawns, but chemicals are inefficient for use on a large scale.

Other methods advised by different authorities are the use of frames at night on nursery stock, fires at night to attract flying beetles, skim ploughing in March to expose the larvae, and the injection of calcium cyanide or carbon bisulphide into the soil.

THE DIAMOND-BACK MOTH (Plutella maculipennis).

This is a most important and practically universal pest of cruciferous crops (cabbages, turnips, etc.). The larvae destroy all soft tissues of the leaf, usually making irregularly-shaped holes. Two or more broods a year.

Description and Life History.—Moth: In spring, the moths hatch from the cocoons overwintered on cruciferous weeds. The **adult** is nearly ½-inch in length, with a wing-span of about 2-3-inch, **and having** greyish-brown wings, the fore pair of which are marked with three white triangular markings on the hind margin, forming a diamond shape when the moth is resting. In this position, a decided tuft is noticeable at the hind portion of the wings. The posterior pair are fringed with long hairs (frenulum). Greyish legs and long, slender antennae.

Egg: The creamy, cylindrical eggs are laid by the moths of the first broods on the underside of leaves of weeds, and later on cultivated plants.

Larva: The eggs hatch in about 10 days, the larvae feeding on the underside of the leaf and dropping to the ground by a silk thread when disturbed. The ½-inch, fully grown larva is a spindle-shaped cater- usually have no protective covering, although covered by a waxy bloom. After feeding for about 3 to 4 weeks, this pupates on the leaf.

Pupa: This is enclosed in a white or yellowish, loosely-spun cocoon, and emerges as a moth in from 2 to 3 weeks.

Control.—(1) The eradication of cruciferous weeds is of considerable help. (Wild turnips, wild mustard, cress, shepherd's purse, etc.) (2) A cultivator with scrub or brush attached, breaks the threads and dislodges the caterpillars, and a horse-hoe following buries or crushes them. (3) Spraying with kerosene emulsion is expensive and apt to be ineffective owing to the caterpillars being on the under surface of the leaves. Forcing under the leaves of infected plants a mixture of soot and lime (3 to 1) 2 to 6 bushels to the acre, might be tried on small areas.

APHIDES (Green "Fly" or "Plant Lice").

These familiar pests are sap-suckers, and form many species, attacking plants of most classes.

Description.—Aphides resemble the scale insects (Coccidae) but usually have no prtective covering , although covered by a waxy bloom. The woolly aphis and others are protected by a woolly covering. Plant lice have small, plump bodies, and comparatively long, slender antennae and legs. Being hemipterous, they undergo direct metamorphosis. Coricles ("**honey-tubes**") are usually present on the abdomen. Besides the **injury** caused by the insects' sucking, the "honey-dew" secreted, **being** fed upon by a black fungous, blocks the stomata of the leaves.

Life-History.—In spring, winged females produce parthenogenetically and viviparously successive generations of wingless females.

These, during the summer, give rise to colonies of winged and wingless females. In the autumn, both males and females are produced, giving rise to eggs which rest over winter, and produce wingless females the following spring.

Control.—The treatment varies with the species, but general methods are:—

(1) Destruction of prunings, which probably harbour eggs.
(2) Nicotine, soap, kerosene, or red oil sprays.
(3) Winter washing with caustic sprays.

Natural enemies are: Ladybirds (Coccinellidae), the maggots of the well-known hover flies (Syrphus), the larvae of the neuropterous lace-wings (Hemerobiidae), and of the Chalcid flies (Chalcididae).

—T.W.,Ag. 3.

A BALANCED MEAL.

NOURISHING LUNCHEON NECESSARY TO HEALTH.

It is very important for every boy or girl to have three good meals a day. These meals must be taken at regular hours, and contain the right foods so that the physical condition of the boy or girl is improved. It is hard to plan an appetising meal with enough variety to tempt the fickle appetite of growing girls or to satisfy the appetite of growing boys. If the luncheon really satisfied there would not be that craving for sweets which is the cause of many illnesses.

The luncheon should contain from 600 to 700 Calories of such foods as will provide a well-proportioned amount of the various foodstuffs. The more satisfying combinations are made from sandwiches made from wholewheat, raisin or nut breads, simple desserts, milk and fruit.

Good fillings for the sandwiches may be made from eggs, meat, fish, cheese, peanut butter, marmite and walnuts, peas, baked beans, and dried fruits. These fillings are rich in protein and iron.

Children must have plenty of milk for growth. Milk is by far the best food from which to obtain both the Calcium and Vitamins A and D in the quantities needed for either children or adults. Milk also provides growth promoting proteins. Each growing boy or girl should have at least 1½ pints of milk a day. Milk should be included in every luncheon either as a beverage or in some cooked form such as custard, or milk puddings. If possible, raw fruit should be included in every lunch box.

Care must be taken to provide protein, Mineral Salts and Vitamins, and at the same time there must be energy enough to last during the afternoon so that the body will not have to burn its own tissues to keep going. As simple a luncheon as milk and wholewheat bread and butter would provide all the requirements. A luncheon should be planned with care. The smaller the amount to be spent, the more necessary it is that it be spent to good advantage. The cost is not an indication of the food value.

The following are suggestions for adequate balanced luncheons that can be procured at the Cafeteria during the summer months for 5d. During the Winter, soup and hot dishes replace the salads.

	Calories.
Egg and Tomato Salad with Dressing	289
1 Wholewheat Roll	100
¾ Cube Butter	75
1 Serving Creamed Sago	140
½ Cup Milk	100
Total Calories	704

Mixed Vegetable Salad (Peas, Carrots, Potatoes.	150
2 Tablespoonfuls salad Dressing	200
1 Baked Apple with Sugar	150
1 Serving Boiled Custard	80
¾ Cup Milk	120
Total Calories	700

Mixed Vegetable Salad (Beans, Beetroot, Celery)	67
2 Tablespoonfuls Salad Dressing	200
1 Wholewheat Roll	100
¾ Cube Butter	75
½ Cup Chocolate Mould	140
¾ Cup Milk	120
Total Calories	702

Salmon Mould Salad with Dressing	313
1 Wholewheat Roll	100
¾ Cube Butter	75
Baked Apple with Sugar	150
¼ Cup Custard	80
Total Calories	718

Banana and Peanut Salad with Dressing	405
1 Wholewheat Roll	100
¾ Cube Butter	75
¾ Cup Milk	120
Total Calories	700

Wire Worms.

In many districts trouble is caused by the larvae of the click beetles (Agristes sp) commonly known as wireworms. They eat into such crops as potatoes, carrots, etc., often rendering them unsuitable for use.

The pest is difficult to eliminate but the following are methods which give a measure of control:—

(1) Attack is especially severe after grass. It is, therefore, esential to bury the turf well and have a firm seed bed.

(2) On a small scale they may be trapped by burying a split carrot just beneath the surface, at intervals. The baits can be dug up later and destroyed.

(3) A good method consists in growing wheat in rows 4 feet apart. This attracts the wireworms so that if calcium or potassium cyanide is sown down the same rows a few inches under the soil as soon as the wheat has germinated, a satisfactory control is obtained. It must be remembered that cyanide is a decided poison.

(4) Mustard dug into the soil and naphthalene dressings 2-5 cwt. per acre, often helps to eradicate the pest but the efficiency of these methods is doubtful.

THE GYRO-COMPASS.

A BOON TO MODERN SHIPPING.

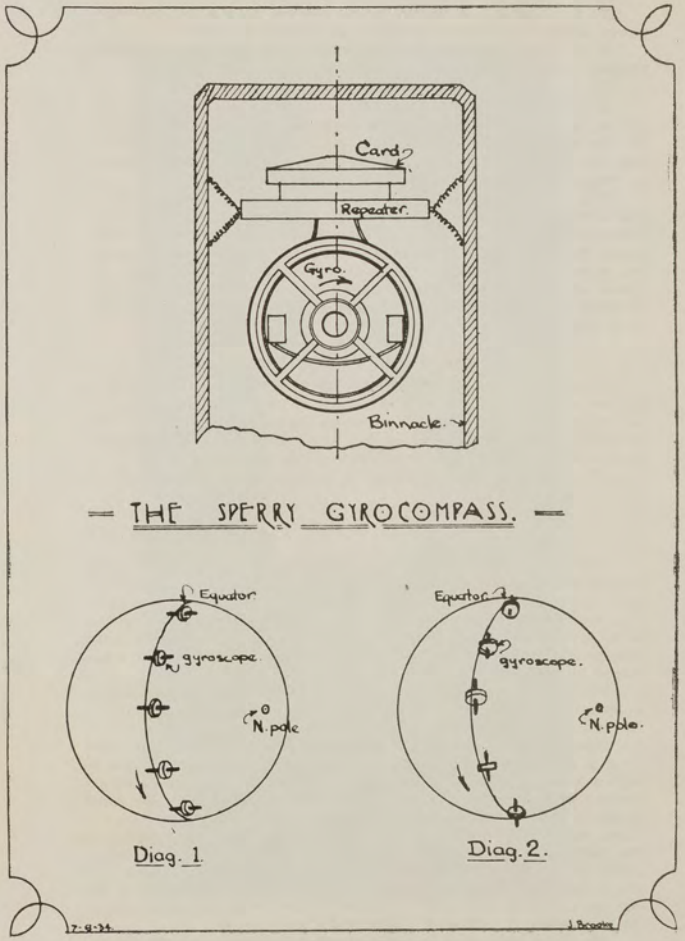
We often hear someone say, when a new ship comes into the harbour, "Yes, that's the SS. 'So and So'—she's got a gyro-compass." And his friend looks with an air of infinite knowledge although he's never heard of one, and says, "Has she really?'" Then they studiously drop the subject and go on to talk about the weather.

Very few people know what a gyro-compass is, and of these few, many do not know how, or why it works. First of all, may I tell you what it does. The gyro-compass is a production of modern science, is installed in most of our warships, and a large number of the latest passenger ships and it has two main advantages. First, it points to true North, not to magnetic North, and hence the variation between these two need not be known. Second, it can be arranged to control electrical mechanism by which the ship can be steered on a set course without any human aid, except supervision of the mechanism. The compass itself consists of a small flywheel, about 12 inches in diameter, mounted on a horizontal shaft. This flywheel is spun by a directly connected electric motor at from 10,000 to 12,000 revolutions per minute and takes from five to ten hours to get up its required speed and adjustment.

Now for the principle. Most people have had experience of a gyroscope in some form. An ordinary top stands on its end by gyroscopic action, or in other words, any fast-spinning wheel objects to being tilted from its initial position. To go a step further, try this simple experiment. Take out the front wheel of your bicycle. (If you haven't one, take someone else's, but see that he doesn't know about it!) Spin the wheel and hold the axle in both hands, horizontally. Try to tilt the axle. You will find that the axle doesn't want to tilt but prefers to skew round towards you! This is the phenomenon known as "precession" and on this fact depends the working of the compass.

The earth, as you know, is approximately a sphere, and spins round on its axis, from west to east, once in twenty-four hours. Its axis is, of course, a line through its centre from the North to the South pole. I have just said that a gyroscope does not want to change its position in space. Now look at diagram 1. Consider that we are on the equator, and that we start our gyro spinning with one end pointing towards the North pole. Then as the earth rotates, it will not affect the gyro and it can go on pointing towards the North pole without interruption. But what happens if the gyroscope is not pointing towards the pole in the beginning. See diagram 2. Here, as the earth rotates, the gyroscope will be tilted, and will turn right over once a day. And as you have seen, the gyroscope would rather not tilt—so it "precesses." The result is that in the end it lines up with the earth's axis, as being the line of least resistance. So either way, the gyroscope if left to its own devices will point North and South. Here, then, we have the general principle. In order to keep the axis horizontal on the earth's surface, a heavy balance weight is used. There are, of course, many difficulties, such as the pitching of the ship, that have had to be overcome, but the modern instrument is both reliable and accurate. Only two adjustments are required, one for latitude, and the other for the speed of the ship.

The gyroscopic action however, is only strong enough to overcome friction, and has to be transmitted through repeater systems to the compass card itself, and thence possible to an automatic steersman. This is done by electric relays.



The disadvantages of the gyro-compass are:—

(1) It costs upward of £2,000 for a complete installation.

(2) It is dependent on the ship's electric supply for its motive power, although automatic standbys are usually provided.

(3) It is an intricate piece of mechanism and needs a skilled operator to make any repairs or adjustments.

(4) It takes about six hours to develop working speed.

Its advantages, however, are that it is not affected by the presence of iron, as is a magnetic compass, and the fact that it points 0-degrees or true north simplifies navigation. It can be used, as indicated, to hold the ship on her course, and any number of duplicate compasses, or "repeaters" can be placed at any point on the ship.

Still, of course, most ships carry both types of compass, for at sea anything may happen, and every possibility must be prepared for. I believe the "Aorangi" of the Union Steam Ship Company's trans-pacific fleet, was the first steamer trading to New Zealand to employ the gyro-compass, and this compass traces directly on a chart, the course of the ship from San Francisco to New Zealand, in addition to doing most of the steering, except in exceptionally bad weather, or in approaching port.

WHAT IS PRINTING?

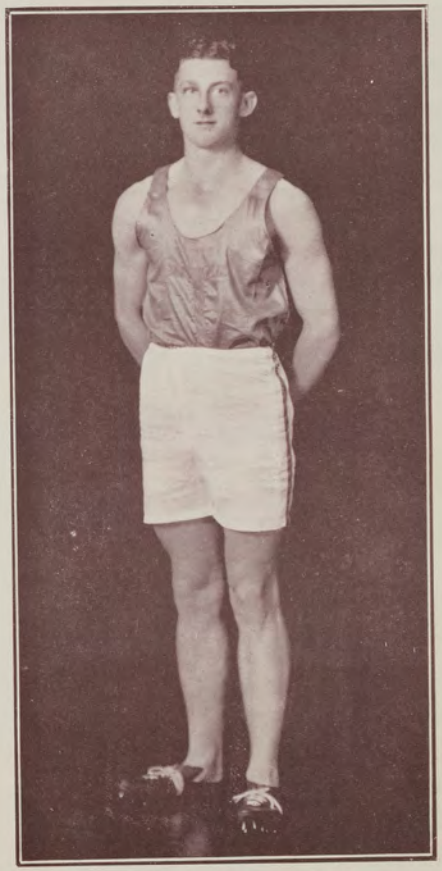
To put it as simply as possible, printing consists of making a picture or pritten matter on wood, metal or stone, and by inking this and applying paper producing as many copies as is required. The methods of doing this are legion, but to all intents and purposes they all fall within three categories, which are as follows:—

1. When the type or image is raised, known as letterpress printing.
2. When the type or image is level, known as lithography.
3. When the type or image is sunk, known as engraving (also intaglio or photogravure).

The first is the most used, and is the old original method of printing, being the same principle exactly as Caxton's first efforts with woodcuts. Newspapers, books, and most catalogues are printed in this way. The type blocks, or stereos, are prepared so that the part required to be printed stands out from the surface, and when the inking roller passes over this, only the outstanding portions are inked and transferred to the paper.

The second method, which is a comparatively recent invention, is on a rather different principle from the other two, and depends on the antipathy of water and grease. The design is simply sketched on to the stone or metal and is not raised or sunk from the surrounding level at all, and the parts which are required to be printed are treated with a greasy ink, while those parts which should come out blank are treated with water. Before each sheet of paper is applied, one roller dampens the design and another inks it; owing to the antipathy of these two liquids, the water from the damping roller only penetrates the bare parts of the stone or metal, and the ink from the inking roller is only left on those parts which have already been treated with the greasy ink; in consequence, when the paper is applied, only the portion of the design which has been treated with the grease leaves its impression.

The third method is the exact opposite to the first. The design is etched into the plate and is below the surface. The inking roller is passed over this and the plate wiped, leaving the ink only in the depressions. The paper is applied with a heavy pressure and the design is transferred, varying in intensity with the depth of the cut and, therefore, the amount of ink.



M. WAKEFIELD (Head Prefect).
Hindley Scholar, Captain of First XI. and First XV., Senior Athletic Champion, Tennis Doubles Champion, and Head of Binns House.
—S. P. Andrew.

LITERARY SECTION

As in 1933, prizes have been offered for the best contributions in serious prose and verse, humorous prose and verse. Once again, the bulk of the literary efforts have been confined to serious topics. This year, however, some poems of a humorous nature have been submitted and a prize has been awarded in this section. The Editor thanks those boys and girls who have sent in contributions, even although it has not been possible to publish all of the work.

Prizes have been awarded as follows:—

(a) **Serious Poetry:** Althea Pallister, Com. 3A.
(b) **Humorous Poetry:** T. Woodward, Ag. 4.
(c) **Serious Prose:** Wynne Feil, Diploma.
(d) **Humorous Prose:** C. Hogarth, W.2.

POETRY SECTION

Prize for Serious Poetry

"FROM SUNSET TO DAWN"

In the twilight of eventide,
The stream winds on its way,
And mists among the reeds abide,
At close of every day.

Appears the starry moonlit sky.
With clearest crystal beams,
To bid the parting day good-bye,
Where shining water gleams.

Soon will dawn be breaking brightly
To fade this dawning view,
And breezes come a'stealing lightly
O'er fields agleam with dew.

The dawning day is here at last,
To bid the night farewell;
The silvery moonlight fading fast,
Marks night's parting knell.

The sun is now above the crest
Of hills across the vale;
And now the shivering plants are blest
With sunshine, warm and hale.

The sun grows stronger, rising high,
Looks down upon the sight
Where grey-black shadows dimly lie
Against the sky's faint light.

The birds now waken from their sleep
With glad and joyous hearts,
Aloud to trill, where willows weep,
"Oh joy! The night has passed!"

—A. Pallister, Com. 3A.

Prize for Humorous Verse

TOGA VIRILIS

OR, "NEW CAPS FOR OLD."

The crowd is parted—Lo, he comes!
No wielder of the club or sword;
A solitary stranger he,
All heedless of, in fact, quite bored
By jealous blasphemy.

With head erect and jaunty gait,
He scorns the smiles and passing jeers,
Of those whom indiscriminate fate
Had safely placed in other spheres.

To him his friends this question cried,
"Why thus so startlingly arrayed?"
And he, resisting homicide,
This haughty answer boldly made:

"The Chief ordained that every man
Shall henceforth now adorn his brow,
According to the latest plan,
With casque of emerald and of gold."

And thus, things passed, as oft things do,
With nothing startling, nothing new,
Until a regal holiday
Necessitating grand display,
Our many warriors drew.

And then, to sound of drum and brass,
The many ranks of marchers marched
Along the expanse of verdant grass,
And never once they swayed or arched.

That was a truly gorgeous sight,
More glorious was never seen,
As line on line of colour bright,
Was bathed in sunlight's brightest sheen.

And many a cheering message came,
Which, marvelling at such stateliness,
Did raise quite to the heights of fame,
That absolutely new head-dress.

Thus now, when asked if Tech. boys we
A custom has of late upgrown,
To raise the hat with courtesy,
And, bowing, state in cultured tone,
"I am a College lad!"

—T.W., Ag. 4.

THE FAIRIES AT PLAY

See the little fairies bright,
  Dancing in the pale moonlight,
See them fluttering in the breeze,
  Floating down as light as leaves.

This is how they dance and play,
  Wasting all the day away,
Up they go, and round about,
  Down and through and in and out.

—E.M., Dom. 1C.

Highly Commended

THE VAGRANT

I wander homeless and alone,
I'm ever on the road,
I pass where winds through flowers have blown,
Stealing their scented load.
I hear the rippling of the stream,
I marvel at the sunset gleam.

The wandering nature within me calls,
To places far and near,
Leaning on fences, gates and walls,
Set free from every care,
Gazing at an old grey mill,
Going and coming where I will.

But my wandering days are over,
I'm getting old and grey,
And the cooing of the plover
And the sun's bright, golden ray,
And the humming of the bee,
Will no longer welcome me.

—V.W., Dom. 1E.

SCHOOL FEVER

(With Apologies to Masefield.)

I must go back to school again to the good old S.M.T.C.,
And all I ask is a prefectship and a kid to fag for me,
And the master's praise for football with the team all toiling,
And a good fat pie in the tuck-shop nigh, and some cocoa boiling.

I must go back to school again for the call of a currant square,
It's a wild call and a clear call when the scent floats through the air,
And all I ask is some hard cash with the tuck-shop open nigh,
And the peanut browns, and fruit pies hot, and the janitor's cheery cry.

I must go back to school again, to the jolly schoolboy life
Where the Head's way is not our way, when the strap's like a carving knife,
And all I ask is a Zane Grey and a prefect's life in clover,
And a quiet rest and a bag of chews when the day's work's over.

—D.S., E. 2A.

SHORT HISTORY OF A CAT

We had a cat,
That on our mat,
One night did come to stay.

That cat refused
To be abused,
And would not go away.

Cat remained;
Was most well trained,
And soon as good as gold.

Cat had a fight
One moonlight night,
Was drowned in water cold.

—H.Q., Com. 2C.

AN EPITAPH

Weep your tears, sigh your sighs, sound a funeral note,
As his form to the sick-room we hurry,
We know he will die a most terrible death—
At the cafe he ate a plateful of curry!

We'll bury him deep with two cakes and a pie,
For hunger his long sleep might waken,
But he'll lie like a boy who has eaten too much
And has gone where bad boys are taken.

Thrice daily we'll think of the gourmand that's gone,
And over him put up this verse:
"Here lies a Tech. boy who ate too much food,
So they brought him down here in a hearse."

—H.W., Com. 3A.

Highly Commended

A STORM

Heavy clouds o'ercame the sky,
The dipping sun was lost to sight.
The gulls flew landward, passing by
The beacon with its gleaming light.

The wind increased in strength,
And now the storm was nigh;
The dazzling lightning flashed at length
Across the starless sky.

The coast was swept from end to end
With piercing, howling gusts of wind,
That screeched and whined at every bend,
And moaned in caverns, dark and dim.

The foam was shot into the air,
The waves were dashed against the shore
Like great white mountains rising there,
Yet seemed the storm to rage still more.

A sudden roar, a sudden crash!
Whistling, whining, screeching, howling,
Against the rocks the waves did lash,
While on the cliff the beacon towering.

A lapse . . . the sea subsides,
The gusts now seem to pass,
The moon doth rise with ebbing tide,
And peace proclaimed at last.

—R.G., Typo. 1

G(OOD) B(YE) S(HAW)

He landed on New Zealand shores,
A man called "G.B.S.,"
His criticism had no pause—
Our vanity grew less!

Long whiskers white, they framed his face,
Half hidden from the eye,
He scared us ere he left this place,
"Communists!" he did cry.

Famous was he, but who could know
What next that man would say,
But now he's gone away, and oh!
Let's hope he's gone to stay!

—H.W., Com. 3A.

THE TUCK SHOP TRAGEDY

The boy stood in the Tuck Shop,
Whence all but he had fled,
Picking up the papers
And little chunks of bread.

All the shop was tidy,
He stood and gave a sigh—
When Mister Prefect entered
And spied a piece of pie.

Tucked there in a corner
Was a piece of hobnailed crust;
The boy went red about the gills,
I thought that he would bust.

The agony of that poor kid,
Was terrible to see;
I felt it very keenly,
For that little boy was me.

Now, who invented Prefects
To come along and spy
Into that little Tuck Shop
And find that piece of pie.

—N.S., Ag. 2.

"ANSWERS"

(Concerning Mr. Sc—t.)

Now all of us like homework bright,
I do not think!—You might,
It is to us a great delight
To sit for hours at night,
In many a thrilling, breathless fight,
To find an answer, right.

Some of the books, as many say,
Have answers, by the way,
And though the working be astray
Yet "answers" are O.K.
The master says, "Been slacking, eh?
Detention for your play,
And don't forget, I mean 'To-day'."

—G.W., E. 2A.

SINGING TO BEAUTIFUL NATURE

I sing my songs to the winds that blow,
That thunder and boom on the bursting snow, ...
And often they creep far down the hills,
Into the hearts of little rills.
And oft at the close of a summer day,
On the breeze they float, and far away
I hear their echoes soft and sweet,
Dancing into my soul, with gliding feet.

I sing my songs to the mountain streams,
To the beautiful birds, and the water that gleams,
To the soft green grass about my feet,
And the blue violets that smell so sweet.
And yet I look the live-long day,
For new things to sing about and say,
"To see these things is indeed a treat,
How wonderful is Nature, forever so sweet."

—D.N., Dom. 1D.

THE RAINBOW

They say, I am told,
That a pot full of gold
Can be found at the foot of the rainbow.
So if it is true
When the sky is blue
And the clouds go floating by,
Off I will go
On a swan, white as snow,
And on through the air we will fly.
And if I unfold
That pot full of gold,
I promise I'll share it with you,
But you never can know
How far I must go,
Before I discover it's true.
Then swan and I
Back home will fly.
When the sunbeams are glittering bright,
They'll shine so bold.
On that pot full of gold,
That will end our adventurous flight.

—M.B., Com. 1A.

ON GETTING TO SCHOOL

I sprang out of bed 'twas a quarter past eight,
Oh, if Time would have mercy and for a while wait!
"Hurry up!" cried my mother, as the clock struck half-past.
"Hurry-up," echoed the walls—I was ready at last.
Behind shut the door, I'd ten minutes to go,
And into the mile run, I started not slow.

I stopped not a moment; I kept the great pace,
Running on, running on, in that memorable race,
I glanced at my case, 'twas as heavy as lead,
My face was becoming more red and more red;
I redoubled my efforts to reach there in time,
But, alas! it was then that I heard the clock chime.

'Twas eighty fifty at starting, but as I drew near
The school gates, at the door, O, who should appear
Someone whom we have learned to obey,
And without whom 'tis said our school would decay.
At the door stood a prefect, she gave me a frown,
As in her black book she wrote my name down.

In Room 38 that night I remained,
And in long lists of long-tots my faculties trained,
I watched all the girls as the room doors they passed,
And sighed when I thought I was bound to be last.
And so, my dear readers, you learn from my fate,
It's a very good policy not to be late.

—R.H., Com. 3A.

Pompeii was destroyed by an overflow of saliva from the Vatican.

LXXX.—Love and Kisses.

A skeleton is a man with his inside out and his outside off.

ROOM 13

Grime and ink, ink and grime,
Cobwebs telling the tale of time,
Rickety tables and broken chairs,
Ceilings blackened and walls all bare,
Altogether a desolate scene,
Such was the study, Number 13.

The news fell on the Principal's ears,
Fellows objected would have no truck,
They had it painted and all fixed up,
And when the pupils heard they had fears,
That in it they could have no more fun for many years.

But the whole class were mighty keen
When they were transferred to Study 15.
For now they have all the fun they need,
Without having to take unnecessary heed.

—A.V., Acc. 1B.

MORNING

The grey light of dawn crept stealthily
O'er land and sea and sky,
The crisp chilling breeze of a winter's morn,
Blew fresh as it whistled by.

Already the stars had disappeared,
The skies looked grey above,
And the first bright rays of the early sun,
To the world sent a message of love.

On the green fields which were clad with dew,
A rabbit hopped along,
From the whispering trees comes a note of joy,
As a bell-bird trills its song.

The sun became warmer and brighter,
The sky of deeper hue,
All the village awoke from its slumbers
To welcome the day anew.

—B. MacM., Dom. 1F.

WITH APOLOGIES TO MILTON

When we consider how our lives are spent
Ere half our youth by this dark school and staff,
And that one talent just to talk and laugh,
Lodged with us useless and our hearts more bent,
To serve therewith our mistress and present
Our good behaviour, lest she, returning, chaff.
Does she exact day labour?—"Oh, not half!"
We freely answer—But Prefects to prevent
Our murmurs soon reply—"No need to-day
For laughing and for talk, who best
Bear our hard yoke, they love us most."
Their state
Is queenly: thousands at their bidding stay
And do long-tots and problems, without rest,
They also serve who share their best friend's fate.

—E.P., Com. 3A.

THE STORM

I stood upon the sandy shore,
And gazed across the sea,
And pondered o'er one lonely thought,
What would it bring to me?

The tall cliffs towered above me,
The sky was brightest blue,
And yet some dark clouds gathered
And blotted out the view.

Some drops of rain began to fall,
And, as I took my way,
I glanced below with a frightened look—
A ship was in the bay.

The waves tossed high into the air,
The wind blew o'er the foam,
I looked again with anxious care,
When would that ship reach home.

The lighthouse light shone all around,
It glittered through the bay,
And as the little ship went down,
I sadly turned away.

—N.L.C., Com. 1A.

WANTED—A SUBJECT

Some write of English cricket,
And some of Kingsford Smith,
Some take their pens and scribble
Of Hitler and his kith.

And then I turn to China
And her never-ceasing fights;
In vain I do endeavour
To picture Tasman flights.

But with these many subjects
There's not a single man,
Of whom I'd write a poem
On a truly novel plan.

So, in my desperation,
I even look things up
On polar exploration.
Or on the Melbourne Cup.

The elusive muses flee me,
With winged, o'er soaring feet,
And inspirations vanished—
I must confess I'm "beat."

—T.W., Ag. 4.

THE HAUNTED HOUSE

Creaking stairs and banging doors,
Noises echoing on the floors;
Talking soft and clanging chains,
Swishing silks and tapping canes;
Spectres gliding through the night,
Some in black and some in white,
Shivers running down one's spine,
Trickling drops as if like wine;
Shrieks for mercy, moans of pain,
In the Haunted House again.

—J.S., Com. 3B.

Mount Cook from Lake Pukaki, South Island, New Zealand

—By courtesy of "Auckland Star."

THE WORLD IS TOO MUCH WITH US

Homework is too much with us; night and day
Thinking and writing, we lay waste our powers:
Little we see in shorthand that we know;
We have given our time away, we get no pay!
This thought and that, that will always stray,
This homework that we have to do all hours,
When we could be out admiring pretty flowers,
For this, for everything, we must be as clay.
We like it not—Great God; I'd rather be
A merciless teacher setting homework
So might I, from my wretched homework flee,
Forget my troubles, borne of history's murk,
Forget which king came after Edward three,
Forget the teachers who set us the work.

—S.S., Com. 3A.

HOME, SWEET HOME

High in the mountains a little cottage lies,
Nestling near the summit, close to the skies;
In this wee homestead, a dear one is waiting
There where the birds in the pine trees are mating,
Watching and waiting, praying I'll come,
Back to the cottage I used to call home.

—J.S., Com. 3B.

BERNARD, I'M SHAW

(Anthem to be sung at Civic receptions in the near future.)

Illustriously learned
Philosopher and sage,
Our one, our only Bernard,
Who rules the printed page—
We with a meek surrender
Await the moment when
In your bewhiskered splendour
You beard us in our den.

To those with an undying
Affection for your wit,
The news is gratifying,
To say the least of it.
Sure as my name's MacPherson
It thrills me to the core
To see that face in person
Upon our native Shaw.

In one outstanding virtue
New Zealand takes the bun,
The cablegrams assert you
Are out in search of sun.
And that, O mighty sage is
The only thing to do—
For though it seems outrageous,
The sun won't come to you.

—R. G. Park.

PROSE SECTION

GEORGE BERNARD SHAW

Prize for Serious Prose

George Bernard Shaw! What a wealth of thoughts this name brings to one's mind. Nearly everyone in the world has heard of this man, and has seen his photograph, but not everyone has had the honour of actually seeing him.

This famous author and playwright has just visited New Zealand, and for weeks before his arrival people were wondering how to welcome him—to greet him with open arms or to give him "the cold shoulder." For this famous old man—he is seventy-eight—is very unconventional—too unconventional for most peoples' likings. He always says exactly what he thinks, and his thoughts are rarely polite.

He has been called many things from a "self advertiser" to the "world's supreme egoist;" from " a benevolent deity to humble authors," to "the world's greatest living genius," and still people do not know what to make of him. He is indifferent to public opinion—he does not care what people think or say of him. He is different—has been ever since he came before the eyes and ears of the world.

He loves to appear outrageous to shock the world, to disconcert and amaze it. When he first became famous the world was startled by his sayings; now it has accomplished the difficult feat of ignoring them. When he visited America a short time ago, he told the people exactly what he thought of them, but even his most biting utterances were dismissed as "typical witticisms." The world is his playground, the nations his footballs—to kick about as he pleases.

He was a sort of social reformer, and his only desire was to tell the truth. But the world, when it had got over the first shock, decided that he was doing it for an advertising stunt. Now, we feel that he is toiling manfully for our amusement, and when we place him in the national line of heroes, it is somewhat between P. G. Wodehouse and Harry Lauder.

Mr. Shaw is, although many people do not know it, a disciple of Samuel Butler. In fact, if he had not pointed it out himself, we might never have known it. But it is from Butler that he gets most of his curious views, for Butler hated cant, disregarded the conventions, and spoke his own mind without fear or favour. As a result he was condemned utterly. If it had not been for his private income, Butler would never have been able to carry on. So on the whole, Mr. Shaw has been quite lucky, for, as one paper says, "If the public has not taken his views seriously enough to believe in them, at least, it has not taken them seriously enough to burn him at the stake.

People worship him as an author, and yet their admiration is tinged with timidity, in case he may "flash out his formidable claws" and harm them. His attacks are keen and swift, but when the return attack comes he simply is not there.

Before he came to these isles, literary circles wondered whether it would be best to leave him alone in case they might be "butchered to make a shavian holiday." Certain citizens thought it best that he should be debarred from this Island paradise, because of his anti-social and Communistic views.

But now he has been and gone again, and the only thing of importance that he said about us, was that we are second to Russia in our Communistic institutions. He was, I admit, very rude about our beloved Rotorua, when he said that he would pay ten pounds never to have been there, but still, why should we worry? It was only his way. It is thus that he has built up the Shavian tradition—never be polite for politeness' sake.

But, even at the bottom of his most cutting remarks, there is some truth, and, when we have listened to him and have studied his works, we can only realise but one thing—the great genius of the man!

—Wynne Feil, Diploma.

Prize for Humorous Prose

THE PARSON'S MISTAKE

London! That city of thriving humanity and—fogs. This night was no exception. It seemed to the Rev. Joshua Broadbean that he was alone—alone, all all alone; alone on the wide—no! my mistake. He thought he was alone in a city of dead. He was striving to find his way to one of his parishioner's houses where a children's party was to be held. Of course, the dear old fellow had been invited, and he had accepted. Even now he was on his way to the great event.

Dim shadows flitted past him, the cold, damp, clammy fog seemed to swirl closer and clutch with long quivering fingers at his drooping shoulders. Hurrying along the damp, slippery streets he made no halt till he came to a dark, narrow lane. Peering into the black void with a shiver of apprehension, Rev. Joshua Broadbean squared his narrow shoulders and bravely ventured along, counting the number of houses till he came to the sixth—or, was it the fifth? Not caring to retrace his steps and count again, Rev. Broadbean opened the front gate, which squeaked hideously, causing his chattering teeth to increase their speed. He looked a strange figure at that moment. A long, mournful face topped by the usual clerical hat; white hair blowing over his wrinkled face, and disappearing into the depths of his capacious overcoat, which engulfed his thin drooping body like an outsize in blankets. Truly he looked a spirit from beyond the pale.

He did not knock at the door as he wanted to give the children a happy surprise, so after listening in vain for the usual signs of merriment, which generally betoken a children's party, he stepped quietly into the long hall. Seeing a bear-rug by the door he gave a husky squeal of delight, as a brilliant idea (for him) came to his brain like a flash of lightning. He would don the bear-skin and give the children a little fright.

Putting it on he dropped on all fours and started a lumbering, rolling run. However, his hands would not keep pace with his long, thin legs, and soon he was sliding along the polished floor on his knees and his chin, making weird gyrations with his hands. Making a well-controlled broadside on his pointed nose, he stopped his slithering run before a partly opened door wherein he detected signs of moving and talking. Giving a deep-throated "Woof," the Rev. Joshua gathered his failing energy and charged the door, bursting into the room like some prehistoric creature. Smiling happily to himself as he heard squeals and cries of fright the dear, old soul lifted the bear skin off his body. He gave a choked-off squeal of terror, turned round and bounded out the open door, for two terrified old ladies huddled in each other's embrace on the top of the table had met his horrified gaze. The terrified females' shrill cries ringing in his ears, the parson stumbled blindly along the passage, out of a side door and into a back street.

Stopping to get some breath back into his poor, cracked lungs, the Rev. Broadbean heard signs of merriment next door—it was the children's party. Did he go into it? No!—— Rev. Joshua Broadbean tottered home to bed.

—C. Hogarth, W. 2A.

EVENING.

The rosy clouds drifted towards the west, where the fiery rays of the setting sun heralded the night. The golden-tipped hills, were screening only half of the sun, leaving the other half displayed in all its beauty to the world. Birds were singing their pleasant evening songs, while whispering breezes shook the trees harmoniously. Grass and plants bent beneath the weight of sparkling dew-drops.

The rippling waters of the lake were crested with silver as they broke musically upon the rocky banks. The beautiful trees stood like tall sentinels on guard, rustling pleasantly as the soft breezes played in and out of their branches. The woods were clothed in darkness as night came creeping on.

Soon the sky darkened to a lovely deep blue, and a pale moon appeared above the blackened hills. Twinkling, golden stars were scattered across the sky. In the valley the town lay, soft and quiet, and the scintillating lights formed a pattern of astonishing beauty. Heavy mists sheeted the hills, and the calmness of the summer night was pleasant. Away from the noisy town, here was solitude, peace, and beauty.

—V.W., D. 1F.

FREQUENTERS OF THE THEATRES.

"Oh! I am going to the theatre on Saturday afternoon!" This sounds very simple, doesn't it? And so it would be but for certain people who frequent theatres for no apparent reason other than to cause others as much discomfort as possible. Let us follow the course of a young visitor to a theatre and see what she must suffer for her afternoon's entertainment.

Her first ordeal is standing in the queue outside the ticket office, where she is jostled from side to side by people who, it would appear, can conjure up elbows at will, and very sharp ones at that. Her feet, too, are never quite safe surrounded as they are by all types of others feet; big feet, little feet, flat feet, and all apparently in search of other feet on which to stand.

Eventually, however, she enters the theatre, and after finally choosing her seat, settles down comfortably and begins to observe the people passing to and fro. In a moment her relaxed attitude is replaced by a rigid and alert one, as her gaze is riveted to a very tall man who is making his way directly to the vacant seat in front of her. He hesitates. Her heart misses a beat. But, oh! Horrors! He decides on that one, and there he sits without the least sign that he might move. Of course, now that he is there, she must just put up with it and see as best she can between his shoulder and the shoulder of the person who is sitting next to him.

She has been so intently watching the "lamp post," in front of her that she has not noticed the arrival of a stout woman, who, not satisfied with her own seat, is endeavouring to occupy a portion of hers, and the result on a rather warm day is far from being satisfactory. To add to these discomforts the woman is accompanied by a small boy whose whole aim in life seems to be to ask as many questions as possible in a shrill, piping voice which can be heard all over the theatre.

The lights are dimmed and advertisement slides begin, causing a temporary hush over the audience. It is too good to last, however, for behind her the following conversation takes place:

"Why! 'Ullo Mrs. Jones. 'Ow are yu gettin' on? My, but you 'ave aged!"

"Well! If it isn't Mrs. Brown! Why, it must be five years since I saw you last and I wouldn't 'ave known you but for that 'at!"

"Oh! 'ere's George!" Raising her voice and beckoning. "'Ere, George, there are two seats down 'ere!" The conversation eventually subsides and the picture begins. The unfortunate girl endeavours to concentrate on it, instead of on the boy on her right who is industriously whittling the arm of her seat with his new "scout" knife.

The thin, piping voice of the child breaks the silence.

"Mummy! is that the bad man?"

"Yes, dear."

"Oh!" Pause.

"Mummy! What is the bad man going to do?"

"Fight the good man, dear."

"Oh!" Pause.

"Mummy! Why is he going to fight the good man?"

"I do not know, dear."

"Oh!" Pause.

"Mummy, can I have some chocolate?"

The mother yields, and after a great deal of rustling the chocolate is produced. The child then dabs a chocolate-coated finger on the girl's sleeve.

This is the last straw, and the young picture-goer almost frantically pushes her way past the stout woman and the little boy, past the rows of knees, past the rows of faces, shining white in the darkness, until she is at last in the street. She looks back and then resolutely turns her face homewards, and decides that never again will she go to pictures on a Saturday afternoon unless she can afford a box far away from stout women, "lamp posts," noisy children, and noisier grown-ups.

—C. LeL., D3.

MORNING IN SUMMER AND IN WINTER—A CONTRAST

What are our feelings as we awake to a morning of dull gloom, sleet and rain, and all the uncomfortable realities of a winter's morning? We glance with half-shut eyes out of the window upon a world of misty, looming objects, blurred and indistinct behind a fine, drizzling rain which makes a soft, pleasant sound upon the house-tops, so that we wish that there was another hour in which to drowse off into the land of dreams again. The cold, grey sky, faintly visible in the east where the light of dawn gradually becomes brighter, taking the place of the dark, lurking shadows, adds to the dismal aspect of it all. Then, as we prepare to disappear beneath the bed-clothes again, to obscure that none-too-attractive scene from our vision, we hear the clock chime the hour. It is only too true that we must arise, to shiver and complain in that uninviting atmosphere of a winter's day!

On the other hand, is it not with soaring spirits and beaming faces that we spring from our beds to welcome the dazzling sunshine and nipping air of a summer's morning? The sweet fragrance of flowers and blossoms comes wafting into the room, stimulating us to greater action in our dressing. Since early dawn the birds have broken into their simple melodies, expressing in their songs all the joy that is in their souls. Down the street a cheery errand-boy whistles with full vehemence, for he, too, inhales that fresh, clean air that gives us life and energy. When we, too, emerge into the sunshine with bright faces and lightened step, do we not perform our duties for that day with a glad and joyful spirit?

—F.W., D. 2A.

MY CORNER

(By the Bore.)

Hullo chums. Pleased to make your acquaintance. You know, it's a funny thing, but all chaps coming to "Tech." usually are no sooner here than they're out after a job. I felt a bit like that myself, so one day in the "hols." I went for a job as a detective's assistant. As I walked up a lot of stairs, I was amazed to find I was the only one applying for the position. I entered an officious-looking room, where an officious-looking man was sitting at an officious-looking desk.

"I came in answer to——" I began.

"I know," he snapped, "Sit!" I looked at him and he looked at me. Then all of a sudden:

"You're engaged," he growled.

"Thank you," I replied.

"Right," he growled again, "Stay here while I get a drink of sherbet." Ten minutes after a gentleman entered.

"I'm Professor Binnit," he announced.

"Really, how long have you binnit?" I asked. He looked a bit disappointed, so I asked him his business.

"I am selling boot polish," he said sweetly.

"Not here," I said firmly. So with a sigh he left. Half an hour later another gentleman entered in a mysterious way. I looked at him dubiously. If this was another boot polish man he was going out on his neck.

"Ha," he grinned, and flew at me. With a swift uppercut I knocked him out, and when my boss returned he nearly jumped out of his skin

"Watsat," he squawked, "You've caught Pop'em-off-Pete. There's a reward out for him." Just then Pop'em-off threw a bomb at me. There was a terrific roar and I awoke to hear the radio announcer say, "The play "Pop'em-off-Pete's Last Hand," will be continued next week. Well, so long, Chums!

—E.W., E. 1D.

ENGLAND IN 1934 B.C

As Grulif the Hunter was slinking through the dark, green, gloomy prehistoric forests of his native land, he cast furtive glances around him, for the forests of England in the nineteenth century B.C. were the haunt of many animals which to-day have their place in pictures or in museums.

As he halted beneath a gigantic tree Grulif suddenly stiffened, for a crashing of undergrowth heralded the approach of some denizen of the forest. Grulif balanced the stone club, which he carried on a thong of gut in his hand. The next instant a huge sabre-toothed tiger came crashing through the undergrowth. Grulif, although he was strong, was very wary as were all of the cavemen of ancient Britain. He immediately swung himself up into the tree under whose leafy branches he had been standing. As the tiger was tensing itself for a spring, its attention was diverted by the appearance of a most deadly antagonist, a dinosaur. The tiger gave a snarl and leapt for the shelter of a nearby thicket. The dinosaur raced after it, and in the ensuing conflict Grulif dashed off through the undergrowth towards a cliff in which his friends and tribe lived.

He climbed up the vines which served as a ladder to the various caves. As he climbed up the vines he gave a chuckle for he thought of the yarn he would tell his friends.

That evening as the tribe was gathered around the fire Grulif told them of his heroic fight with the tiger and how he had killed it. To support his statement he showed them the lacerations on his skin which the wounded tiger had worried.

The tribe crowded around giving grunts of admiration and envy.

—B.T., E. 2C.

BEHIND THE SCENES IN A CLASSROOM

On walking into the schoolroom a casual observer would be struck by the sight of about thirty pupils either busily and conscientiously writing their lessons or intently listening to their learned teacher's words. Perhaps a closer observation of this tranquil scene would reveal someone studiously wrapt up in the noble art of drawing, probably attempting to transfer to a grubby piece of paper a most critical study of the instructor's face. A very subdued ripple of mirth in one corner of the room might draw attention to a budding poet whose works are for the time-being limited to a queer five-lined verse which the enthusiastic author would declare were limericks for the school magazine.

Should the unfortunate teacher, however, venture to leave the peaceful room for a space of five minutes or so, a fly somehow crawling upside down on the ceiling would observe a classroom to be turned into something approaching a gymnastic display. A trivial dispute might be settled after an unauthorised game of tiggy, or an enthusiastic gymnast might find herself after a last frantic, record-breaking effort, sitting in a very undignified way on the floor. A dutiful prefect, trying to administer some sort of law and order would probably find herself buried under a pile of books which have found their way, post-haste from various corners of the room. It is not, however, until the look-out, who has posted herself on a desk in order to view from the fan-light, the length of the corridor, sees the hurried approach of the mistress that silence reigns. The teacher is gratified by the very innocent and busy air of the occupants of the room, and going to her desk announces, "There will be no homework to-night, girls, as you've all been working hard." Jubilation greets the announcement, and the pupils leave the room under the pleasant eyes of the lady in question. Little does she know—Still, "what the eyes doesn't see the heart doesn't grieve for," and "it's all well that ends well."

—K.G., C. 3A.

ON THE WINGS OF IMAGINATION

With a sigh, I lay down "Andersen's Fairy Tales" and stretched myself. I was curled up among the cushions, underneath the nectarine tree, and a loud snore from the region of my feet announced the presence of the cat. I had just finished reading "The Passenger Coach," a story about the months of the year, and I lay back to think about it, but the day was so warm, and the air so still, that I soon fell asleep.

"Wynne!" With a start I sat up, and stared in surprise at my visitor, a very modern, a very alert Santa Claus.

"You have shown such an interest in the story of the months, that King Sol has decided to introduce you to them. Come!" So saying, he took my hand, and before I knew what was happening, I found myself sailing through the air, straight toward the sun. Strange! The air was not as hot as I thought it would be, in fact, the nearer we went the cooler it became. As we sailed along, little white clouds brushed my

cheek, and playful little breezes rushed through my hair. At last! We were there! In the Kingdom of the Sun.

As we set our feet on the ground, many people came towards us; and with a bow, Santa Claus left me in the hands of a dainty, golden-haired, golden-clad, fairy. She, it was, who took me to the palace, a beautiful place, not gold, as I had imagined, but white, with a golden glow around it. She took me through the glistening door, down the passages, the walls hung with beautiful draperies, and into the hall. Seated on the throne at the end of the room was His Majesty, King Sol.

"Welcome!" he cried, "you are just in time. The months are arriving." We heard a rumble of wheels outside the palace, the clatter of feet down the passage, and—the Months stood before me, just as if they had stepped from Andersen's book. With laughter and jokes they came and shook hands with me, then they made way for the Seasons

"Each Season," explained His Majesty, "takes charge of four of the Months, and the Months must obey their mistresses' commands.

First came Summer, a laughing, jolly, girl, with flaxen curls, dressed all in gold, and bearing a horn of fruit. It was obvious that she was the head of the family of Seasons. Following her, came her more timid sister, Spring, a delicate, fairy-like creature, dressed all in pale green, her arms full of flowers, her head crowned with dewdrops. Fast on her heels came Autumn, her petalled frock of reddish-brown, half-hidden by the sheath of corn she carried. Her sister, Winter, followed more slowly. This was the beauty of the family, this slight girl, almost hidden in the folds of her white fur coat. Her eyes sparkled beneath her fur cap as she came toward me.

Just then came the noise of shouting and cheering outside the palace, and soon, in skipped six pretty girls, all dressed the same, but every one in a different colour.

"My friends and servants, the Rainbow Fairies!" explained Winter. "They follow me wherever I go, and only occasionally do they visit my sisters. They do not like Summer very much, she is too high-spirited for them I think, and so, whenever they are naughty, I make them go and work for her."

"I am coming to visit your land very soon," she said. Although she was so beautiful and so charming, I could not suppress a groan, as I thought how much more I preferred her sister, Summer.

It was at this stage that King Sol intervened, "I am afraid it is getting late, Wynne, so you must go. But come and see us again, soon." I bowed, thanked everyone for the happy time I had had, then my "golden" friend hurried me away. At the palace gates, who should be waiting for me, but Father Christmas again?

Back we sailed till we reached the nectarine tree, and there we said "good-bye." Then he vanished—where, I do not know. He just vanished. I curled up in my cushions again and tried to sleep.

"Purr-rr, purr-rr!" sounded in my ears, and I awoke to find the cat settling himself down on the open page of my book. I pushed him off, and glanced at the title on the top of the page. It was, "The Passenger Coach."

Now, all this happened a long, long time ago. At the time I was absolutely sure that it had really happened. Now, I am not so sure. I rather think I imagined it all. Don't you?

.....—W.F., Dip.

In 1495, some twenty-five years after printing was introduced into England, John Tate built the first British paper factory not far from Hertford.

The Minister for Defence presents a medal for markmanship to I. Clarke.

The Old Order Changeth.

"SHAVE AND YE HAIRCUTTE."

Having of late perused several of the immortal Shakespeare's works, an irresistible urge has possessed me to set down, in what might be termed blank verse, an account of a conversation ensuing in the course of a visit to that most well-known of acquaintances, the barber.

Scene: A barber's shop.

Enter: Barber and customer.

Customer: "Prithee, barber, a haircut an you please."

Barber: "Right willingly, good my sir."

Customer: "And, as willingly, I hope, a shaving of the beard, so that, with pointed gracefulness and not excess upon the upward cheek, it doth become a gentleman of state."

Barber: "Sir, most certainly."

Customer: "Also, I would you render tonic cephalistic as denouement to the operation."

Barber: "Right, my worthy sir, I'll go about it. But how, sir, wilt have thy hairs depruned?"

Customer: "Why, not too much off, man."

Barber: "Thou sayest truly, sir, and I did, there'd be, thou pardonning me, none left for future hope but pate's smooth glistening."

Customer: "Hold, barber! Thou'rt in a foolish or a merry mood; which is 't? And yet, your words have truth."

Barber: "Thou art truly right. 'Tis said I know, that, while passing heedless by false accusation, folk yet do baulk at some more petty truth aimed at them."

Customer: "Well, to it, man; my worthy lady has me home at four, an I'm not there, why, when I'm there, there'll things be flying."

Barber: "I comprehend, good sir. I'll speed myself."

. . . . . .

Customer: "'Tis fine a cut as one could wish to see. How much owe I thee?"

Barber: "One shilling and a sixpence, my good sir. 'Tis cheap at that. Good-bye; Godspeed. (exeunt).

—T.W., Ag.4.

EDITH CAVELL

Edith Cavell, the brave nurse and martyr, was the daughter of the Rev. T. Cavell, and her name will forever be glorified with such names as Florence Nightingale and Grace Darling. She received her training in a London hospital, and because of her efficiency, she became the head of a hospital at Brussels.

She continued her work while the Germans were in occupation, and together with other friends she formed a society for helping stray and Allied soldiers to escape into Holland. For these deeds she was denounced as a spy, and was arrested and imprisoned, and when she was tried in 1915, she was found guilty.

Although the American Minister pleaded for her life to be spared, she was shot by the Germans. Her calmness and holiness very much impressed the British chaplain who visited her on the eve of her execution, and her last words to him were, "I am glad to die for my country," and this sweet, brave lady, who had soothed thousands of wounded and dying soldiers, at last was oblivious to the cares and troubles of the world.

—E.A., D. 2A

A DREAM

Fierce war-cries split the silence, and suddenly a squadron of Bristol Fighters swooped down from the trees overhead. Handcuffing me, the natives threw me over their shoulders and started for the Magistrate's Court. When we arrived there I got off my bicycle and walked inside, but no sooner had I started swimming than I saw Jean Batten making a parachute landing with a revolver in one hand and a powder-puff in the other. Noticing me running she pointed the powder-puff at me and pressed the trigger. The three-ought-three barked flame and a sixteen-inch shell whizzed over my head. Reaching up I caught it just in time to save Sharkey, who was in the act of giving George Walker a front-loop slam, and tossed it back.

When the smoke cleared away, I found that I was doing front, back, and side dislocation on the spring-board. With a sudden jump I executed a hand-spring on to the horse, and whooping, grasped the rings and performed a tiger-balance, unfortunately doing the double cutaway just as Tom Mix came around the corner. My 7lbs odd of beef and brawn crashed into him and brought him to the ground. I picked the ball up, and dribbled it through the whole team until, noticing the goals in front of me, I raised the bat and hit it good and hard.

Smack! The tomato hit him in the back of the neck, breaking the pavilion window as it did so. Cheering exultantly, the audience stormed the stage and, hoisting me on to their shoulders, bore me off in triumph to the duck-pond.

There was a sudden heave, and I flew through the air straight towards the muddy water. Splash!

"Help! Help!" I cried, as I struggled in the deep, black waters of the Atlantic Ocean. Swimming for my life, I just managed to dash up the gangway as it was drawn in. No sooner had I seated myself than the train steamed slowly out of the station.

"Reach for the sky, buddy?" hissed a voice in my ear. Looking round I saw Captain Hook standing about twenty feet, nine and seven sixteenth inches away, picturesquely dressed in a frock coat, a pair of plus-fours, a beret and an eye-shade. He was about to search me when I took off my wooden peg-leg and threw it at him. It merely bounced off him and kept flying. After running a couple of miles I managed to catch it and hop in it. I grabbed the control stick, looped-the-loop umpteen dozen times darted into the thick of the fight and lost myself.

Rat-a-tat-a-tat-a-tat! My machine spat viciously, and suddenly my plane blew up. I jumped out with my parachute in one hand, boots in another, and my trousers in the other. Landing safely I jumped up and continued the race; having almost reached the winning post when I missed my footing and rolled over the edge of a precipice. I fell down, and down, and down, and down—Crash! I was sitting on the floor, my bed-clothes strewn around me. As I climbed ruefully back into bed I promised myself that never again would I tackle an extra one of Mr. Cox's pasties.

—S.P., W. 2B.

FACIAL EXPRESSIONS

In the classroom, the many different expressions on the faces of the pupils would be remarked by an observer, if he could only be there to see when a lesson is in progress. In the front desk is a tall, thin girl with horn-rimmed spectacles, who gazes, deep in thought, at the teacher. At the back of the room a girl with wildly-tossed, auburn hair, is sitting; she smiles, probably at the thought of some prank she can play on her unfortunate comrade beside her, a buxom young maid who is gazing round the room in the vain hope that something exciting will happen soon, to enliven an extremely dull lesson. One neat, tidy girl, with plaits, scribbles in her notebook, as if there were no time to lose, and her face is grim as she struggles vainly to get the last words down. Near her sits a pretty girl looking into space. The lesson is lost for her, and she will come back to life with a start at the crisp voice of the mistress asking her some questions. A quiet girl is deeply interested, but in some trifle she is playing with, under her desk, and her face is alive with interest (in the toy, not the teacher). One large, buxom lassie is busy with her own affairs. Behind the teacher's back, she is hurriedly consuming a jam tart, and the skill with which she performs her self-imposed task, shows a knowledge of the art born of long experience! So do expressions—and activities—lend variety to the daily round. —E.R., C. 3A.

THE TALE OF A HORSE

A horse's tail is like a dog's, except that it does not have a little one at each corner, and a tail stuck on at the end. It has a long nose and teeth like a rake. Its ears are like those of a dog, only they are much larger. A horse is the same as a dog, only a bit different. It can't bark, but it can neigh, which a dog can't do.

A horse's tail is like a dog's, except that it does not have a little body in the middle, therefore, you can hold or pull it, and it will not growl at you, like a dog would do.

No animal can do some of the things that a horse does, for instance, only a horse can be ridden in the way that we like to ride; imagine us sitting on the back of any other animal the same as we do on a horse. Even the camel, which is not quite so bad as some of the other animals, has its weakness, how could one possibly sit on its hump, or if it be a dromedary, between its two humps, and go along at the pace like that of a horse.

Horses are very useful, you see, even in motor cars, they have to combine so many horses to make the power to make the car go along. No animal can compare with the old horse. —J.S., C. 3B.

DAWN

The first grey light of dawn broke over the distant mountains and gradually broadened into a dazzling stairway of light, up which one could easily imagine the wee night elves mounting—up, up and away into the clouds to await the evening, when they could scatter the clouds over the now awakening world.

There was a gentle stirring in the forest where the cobwebs were heavy with dewdrops that gleamed like a million scintillating jewels. The faint twittering of the birds gradually increased as they hailed the coming of day. From the east, stealing across the sky, came Lady Dawn, light and airy. At the sight of her the dark clouds fled, leaving the world bathed in the glorious light which was reflected from her pearly garments.

King Sol rose high in the heavens and rested himself on the bank of fluffy, rosy clouds which had freed themselves from under the tapestry of night's jet canopy. The little forest flowers lifted their drooping heads as the rays of the sun penetrated through the cold earth. Yes, they, too, shared the golden glory that the mystic nymph scattered about her.

Down in the valley the mist was rising and a little old-world cottage was revealed. The fragrance from the garden was wafted along on the morning breeze, while a thin wisp of smoke, not unlike gossamer, floated out of the chimney. The tiny streamlet behind the cottage tinkled like a bell as it trickled over the embankment and down into the grassy hollow.

The inspiration of this scene lingers with me amid the hustle and bustle of life. —R.L., C.1 Art.

IF SPEECHES WERE THUS

Mr. ——, Boys and Girls,

A-hem-hur. It gives me great pain to be here this afternoon. As I scan this watery sea of faces, I see some that I have never seen before, and—er—do not wish to see again.

You may think me funny, I'm not, only humorous, when I say, knowing from experiences, that you girls will find it much easier to hit your husbands with a frying pan, than with a pen. I do not think that women should be writers, and even if they do become authoresses, they are sure to be unhappy. I know, so many of our women writers are dreadfully unhappy; that is perhaps the reason why, in their books, the hero nearly always dies, and the villain becomes the best man. Such rot!

As I look at this old hall, I fell rather shy, and I feel like asking Mr. ——, whatever he brought me up here for, at all.

I remember the days when I used to sit on a dirty hall floor and listen to Mr. ——'s dry speeches and lectures, just as you boys and girls do now, and I used to say that when I was old enough, I would have my revenge; I hope I shall.

Doubtlessly, you will think that I like standing up here, but I don't, looking at all the faces in front of me, that is, er-hem, if I may call them so, gives me a queer feeling, and I shall be glad when Mr. —— asks me to sit down again.

Well, having said all that I wish to say to you, I will wish you a Merry Christmas and a Happy New Year, as it leaves me at present.

Thanking you for bearing this load of speech, I will bid you good-bye.

—J. S., C. 3B.

THE ADVANTAGES AND DISADVANTAGES OF BEING YOUNG

Young! Who would not be young, to have life still stretching before one, an adventurous road, with all its gaieties, pleasures, and beauties, waiting to be plucked by eager hands? Ah! How marvellous it is to be young, with no cares or worries, no regrets, with nothing to look back upon, but everything to look forward to. How wonderful to be able to slip along with all the carefree joyousness of youth, to do as one wishes, with no past experiences to make one pause and think! How lovely it is to go along, taking things as one finds them, making new friends every day, learning new things every hour!

But then, there is the other side of life too. That adventurous road has other things for runaway youth, besides beauty and pleasures. Many are the pitfalls and snares on the road that youth must travel. Age has none of these difficulties to contend with; it has passed through them long ago. But youth, poor, happy-go- lucky youth, which started out so blithely will have every illusion shattered as the road winds on. Those whom it thought to be true it will find to be false. That which it thought to be good, it will find to be bad. Cares will come, and hurtful experiences will teach it to be wary.

So, although youth may be a wonderful time, full of joy, and tactfulness, perhaps age is the best, when one has traversed that adventurous road, and wisdom and knowledge have taken the place of youthful gaiety and ignorance.

—W.F., Dip.

They gave the Duke of Wellington a lovely funeral. It took six men to carry the beer.

NEW SHOES

A large, expensive, plate-glass window, and my heart was palpitating violently. At last, the moment had come when I could purchase those shoes, which I had coveted for weeks. Would they still be there? —so neat, so trim and smart, reposing on their soft bed of velvet. Yes! yes! still the same, and now all I had to do, was enter the shop and make my purchase. Of course, they must be tried on, but they could not possibly fail to fit, when the appearance was so desirable. Stifling a few qualms I assured the assistant they would do, and proceeded home, a proud possessor.

Now I could wear them to our long planned picnic!

The morning dawned bright and clear and my joy was complete, when I donned my new shoes. Of course, they were very stiff, but one must expect that from new shoes, and pride really feels no hurt.

For the first mile all went well. Then doubts began to assail as to whether patent leather was the best material for shoes. How those shoes seemed to be shrinking, or was it, that my feet had suddenly been afflicted by a serious disease and were rapidly and visibly swelling, until they almost burst from the shoes?

Another mile! No longer was there any brightness in the sun. Why was it that all the rest of the party were laughing, talking, and enjoying themselves immensely, when my whole world was full of feet and shoes—absolutely nothing else? No sunshine—No flowers—No enjoyment or pleasure!

At this stage came the final catastrophe. I tried to gather myself together, but collapsed in a heap. Yes, there it was—only a little stone, but treading on it, unawares, had been my undoing.

Whilst the rest of the hikers jogged merrily on, I crept to a wayside paddock and removed those hateful shoes, wishing I could deposit them in the depths of the ocean. I then crept home, barefooted, a sadder, but a wiser girl.

No! Never again will I attempt an outing in new shoes!

—E.M.P., D. 2A.

SUNSET SCENE

The spirt of the wanderer urged me on, through the gathering gloom, into the land of the unknown. My horse and I were the solitary beings on the beaten track, which led to the high mountain ridges.

As we slackened pace, at the summit of one of the highest ridges, I gazed in rapture at the colourful panorama before me.

A little green valley lay snugly folded between the mountain ranges. The sun, as it slowly glided towards the ranges, cast a golden radiance over the still waters of a sleeping lake, at the foot of the mountain.

The trees whispered and then grew still, the water crept a little higher up the shore, a bird awoke with a frightened cry, and the sun slid behind the mountains, leaving vivid streaks of crimson and orange in the sky.

I seemed to feel the air growing darker and colder around me, then everything was stilled as the last glow faded from the sky, twilight gradually deepened into night, darkness came, and the moon in all her silvery splendour shone down upon the lonely, sleeping valley.

—O. McE., D. 1F.

COLD FEET

Eerie, hollow laughter echoed through the old deserted manor as a white ghostly figure glided across one of the damp, stone-flagged corridors. Thn it was joined by several other ghostly figures, all shining white in the semi-darkness.

"We must catch him," said one in a cracked voice, "or—one of us must return to the underworld," he added with an ominous ring in his superhuman voice. The others indulged in a low chuckle at this and said:

"Never fear! We shall catch him!"

Jim pulled frantically at the iron ring of the massive door, but his efforts were in vain for it would not yield.

"Funny!" he muttered. "I left it open when I came in." He turned sharply. In the distance he heard again the sound of ghostly laughter. He rushed down the first corridor that presented itself, and then coming to a branch in it was about to turn to the right when he beheld, advancing towards him, a ghostly figure with a green luminous appearance about it. Swiftly he turned and fled in the opposite direction; around corners, along dripping corridors, and down moss-covered steps, until at last he reached a passage bordered by rows of barred dungeons.

Faster and faster he sped along until at last he rushed breathlessly into a large stone chamber. He stopped—Startled! Ranged around the walls were white, ghostly figures all standing silently in the dim light as it cast flickering shadows on their grotesque figures. He drew back, but a light feathery touch made him turn, only to find two more ghostly figures behind him. And then the white circle began to close about him. Jim looked about desperately for a way of escape; but all that he saw was a circle of white gradually drawing closer. Ghostly figures closed upon him and drew him over to one side of the chamber while several of the white figures gathered together apart from the others.

"How shall we kill him?" asked one.

"Throw him from the highest tower!" was the answer.

"No! a slower death," suggested the first.

"I have an idea! Let us freeze him to death from the feet upwards," said another with equal emphasis.

"Yes, that's it," agreed the others.

A block of ice was soon produced and Jim was stripped of his leather shoes and warm socks. He struggled feebly, but slowly and surely his feet were drawn down on to the ice.

As they touched it he started, and awoke to find his two feet poking up out of the bed-clothes at the end of his bed.

"Wish mum would tuck the blankets under the mattress at the end of my bed!" he grumbled.

—C. LeL., D. 3.

AT SEA

It was daybreak. Out on the grey sea the huge passenger liner "Petrel" ploughed her way through the mirror-clear waters on her westward journey. On the bridge the first mate stood anxiously watching the sky-line. With the sailor's uncanny sense of stormy weather at hand, even when the sky is blue, he shouted orders to his shipmates to make ready for rough seas. At present the flush of dawn coloured the sky, reflecting in the waters below, but behind that shield of veriegated colours, two or three black clouds were shadowed. The wind had dropped and a calm lay over the sea causing the passengers to think delightedly of a smooth trip, for most of them had an aversion to rough weather, which inevitably for some, brought its own particular form of discomfort.

By ten o'clock the wind had risen slightly and angry-black clouds had blown across the sky in solid, threatening masses. The sun now came weakly through a blanket of fog, which hung about in the upper air, giving the sea a cold, green hue. The frolicking ripples which had smacked on the ship's side a few hours before, now turned to curling, white masses of heaving breakers. The ship, tossed in the maddened sea, suddenly looked frail and small as her big, black bows were buffeted about in the relentless seas. Soon, little pattering raindrops splashed and dripped on the covering of the deck, while up above the lightning streaked and flashed, each golden flare followed by a crash of roaring thunder. The ship headed into the seething mass of leaden waters, while her timbers quivered with the impact of the rolling sea. Then suddenly the dreaded sound of shattering wood reached the ears of those aboard. "We've struck! All hands to the lifeboats," the captain bellowed. The sailors lent ready hands to the work. A rocket flared, blazing in the already lightened sky, while the creaking, groaning timbers of the vessel were broken to matchwood on the cruel rocks that had torn her bows. Before the first lifeboat had touched the hurling sea, a shuddering lurch and a jolting plunge had sent the doomed ship to her watery grave, with all hands aboard.

The lightning lit the tragic scene and the thunder roared a death dirge. Then, slowly, as if satisfied, now that she had won her prey, the frantic fury of the sea subsided; the thunder ceased to roar in the upper air, and a last flash of lightning left the sea enshrouded in soft, clinging, grey mist.

—K.G., C. 3A.

A DAY WHEN EVERYTHING WENT WRONG

A day when everything went wrong! Who has not met with such a day? "Very few," thought Joan.

Joan Marne was the youngest member of the Lower Fourth at the Farrington Boarding School for Young Ladies. She was sitting on the edge of her bed in the cubicle, slowly undressing, and thinking bitterly over the events of the day. Wednesday was a half-holiday—a holiday when enthusiastic cricketers and tennis players, such as Joan, had the whole afternoon to practise in—a holiday when the dramatic club, to which she belonged, entertained the rest of the school, after tea—a holiday to be forfeited by such behaviour as Joan's.

Her thoughts went back to the morning, when she had started the day by sleeping in, and, to get to breakfast on time, she had slid down the bannisters, only to be met at the bottom by Sylvia Forrester, the head girl. That meant two bad conduct marks, one for sliding down the bannisters, the other for being so late that she had to slide down. Luckily, breakfast passed without a break.

At French, everything seemed to be going well until Mademoiselle, usually absent-minded, remembered the preparation. Of course, Joan had not done it, and so she had to forfeit her afternoon's sport to do her "prep."—twice over!

At tea time Joan had accidentally knocked her neighbour's arm, just as she was picking up her cup of tea. The result was—a stained cloth, and Joan's evening spent in getting the stain out: Matron did not see why she should do it!

Now, Joan had finished and had to go to bed. She could hear the rest of the school laughing and clapping in the Assembly Hall, where she longed to be. She put the light out and climbed into bed. For a while she lay and grumbled to herself, then she fell asleep, and the events of the "day when everything went wrong" were forgotten in the land of dreams.

—W.F., Dip.

THE CLIMBING OF MOUNT HOBSON

Five miles east from Port Fitzroy, Great Barrier, along a winding but well-formed road, there is a long beach of pure white sand. At the south end of it, up a small gully, could be seen, one Wednesday morning in February, a small, white tent. This tent had been there since the following Saturday, and was occupied by my brother and me.

At about five o'clock on this fine morning, we had the fire going, the billy on, and some fish frying merrily on one side. At the half hour breakfast was served, and soon disposed of; so at a quarter before six we were on our way to the summit of Mount Hobson, about four or five miles away as the crow flies.

Climbing to the top of Pa Hill, we made our way along a ridge, picking our way among the boulders. However, the track was fairly good, and we made good progress, for after about an hour's walk we came to some bush where the going was more difficult. A few minutes' further walking brought us to a great wall of rock. How were we to go on? We tried to climb up the face of it, but it proved too steep, so we followed it along to the north till we came to a chasm that prevented our going further. Retracing our steps we went to the south, climbing through the undergrowth and down a bank. As we were about to descend further we noticed a rift in the great wall, a possible path, so after a little trouble we managed to climb into it. The rift proved to be several chains long, but only a few feet wide, running into the wall. Following it along we came to a cross rift, cutting at right angles to the first and about eighty degrees to the horizontal. We looked down it, the sight made us feel small—the huge, towering pinnacles of rock that overshadowed us, and the gloomy depth of the chasm.

We climbed into the second rift, and made our way up it, a task made possible only by the roots of trees. Arriving at the end we found ourselves at the top of the wall that had baffled us an hour before. Far below us we could see the path we had followed from the coast.

Turning once more towards the distant peak of Mount Hobson, we walked along the ridge. Continuing thus for about an hour, we came to a deep chasm or rift cutting right through the ridge. Climbing down the north side we came upon a natural bridge made of a dead tree that had been blown across the rift. Was it safe? We hoped so, and wasted no time in putting it to the practical test of crossing it. After crossing the log, for it stood the test, we climbed up the other side. A very difficult and slightly dangerous undertaking, for at first the ground was loose, and when a protruding stone was taken hold of it would often break away. Soon, however, coming to stunted scrub, we found that we were within two miles of our destination; we had safer, but harder work climbing through it. Coming at last to the top we then planned the route that we would follow. This took us down once more into the scrub and the bush-lawyer, which tore our clothes and skin.

At last after half an hour's toil through this impeding scrub, we came to a track which took us almost to the foot of the mountain, once more ascending through scrub, cutty-grass, and at last the real heavy bush. As we entered the bush the grade steepened, and in places was almost vertical. With the aid of the trees we managed to climb to the top of the first point, where we found a track which took us in a short time to our destination, the highest point in all the Great Barrier, two thousand and thirty-eight feet above sea level. But, alas! We had anticipated a fine view, but the clouds were lying over the land below us, so we could see little. One thing, however, we did see was the "Monowai" outside Fitzroy harbour.

Retaruke Stream, Wanganui River, North Island.

—By courtesy of New Zealand Government Publicity Department.

Now for the descent. We had decided to go down the track to Port Fitzroy, and hence by the road back to camp. Walking down the path we came to several great dams made of wood that the lumbermen built and used in the days gone by. The track took us down the stream the lumbermen used, but about half-way down the path divided. We took the one following the stream, which proved to be the wrong one, and brought us out a mile along the coast from Fitzroy. We then proceeded to climb up through the bush in the direction of the port, but we had come to a new impediment to our progress, gorse, and nothing but gorse all the way. Arriving at Fitzroy about five in the afternoon, we began our return journey, and arrived home at camp at seven, tired and hungry, since we had had nothing to eat since breakfast.

—F.L., E. 2C.

ONE MORNING!

In a misty drizzle of rain they stood—shoulder to shoulder—and shivered. Line upon line they faced across the square. With set looks they gazed hopelessly at a relentless Fate, for they knew that in the space of a few short seconds their likenesses would be printed indelibly on an indestructible tablet, one, that inevitably flatters not. Leaden eyes bent a straining gaze on them from beeath a sable stole of sad-coloured velvet. Fingers clawed at the instrument that was to deprive them of the last vestige of pride that they might possess.

A dismal croak came from the depths of the velvet; they braced themselves for the shock. Click! The photograph was taken! Com. 3A dispersed and the photographer emerged from beneath the cover, gesticulating to the next class to assemble.

—H.W., C. 3A.

"STAY HERE"

MR. BOLITHO'S ADVICE.

"It is a mistake to think that the old world offers many advantages over the new," said Mr. Hector Bolitho, the Auckland author, in the course of a brief address to pupils of his old school, the Seddon Memorial Technical College, this morning. "We always think our neighbours better off than we are ourselves, but except for writers, artists and scientists, Europe does not offer any more advantage than New Zealand. I would advise you to stay in New Zealand."

Mr. Bolitho said that he once sat on the floor of the old Technical College Hall and listened to old people telling him what to do when he grew up. He always hoped to get his own back, and now his chance had come. People talked a lot about the historical associations of an old country, but he thought that too much importance was attached to history.

"I once spoke for an hour with Mussolini," said Mr. Bolitho, "and it was the most impressive hour of my life. Mussolini is a thrilling person to meet—not the grim person that his pictures would lead one to believe he is, but a man with a charming manner, an engaging smile, and a sense of humour. He said to me, 'The fault with European civilisation is that we are prone to worship the past at the expense of the future. History should be no more than a vantage ground from which we may look into the future.'"

We had no right to the past, said Mr. Bolitho; it belonged to the people who made it. It was the future that belonged to us. He told his youthful audience that they should all look forward to a life of quiet contentment rather than one of fame, and the girls would be advised to take up cooking rather than writing. Almost all the women who had written books were unhappy and discontented. They had turned from life to writing. "I think," you girls would be advised to rule your future husbands with the frying pan rather than the pen."

"New Zealand is blessed almost beyond any other country," concluded Mr. Bolitho, "and there should be no more happy country in the world. Your future lives in New Zealand, where you can bring dignity and honour to whatever walk of life you take up.

—"Auckland Star," 16/3/34.

ROMANTIC NEW ZEALAND

During the second term the school received the opportunity to visit a very fine scenic film of New Zealand, which has been produced by the Government Publicity Department in order to advertise our country overseas. Those responsible for this work are deserving of the highest praise, and it is certain that "Romantic New Zealand" will attract many tourists—if not permanent settlers—to New Zealand.

The opening scenes were historical—the Maoris approaching Aotea-Roa in their canoes, the visits of Tasman and Cook, views of Waitangi. Then followed some charming glimpses of our own fair city of Auckland—next Russell, rich in historical memories. Each and every one of New Zealand's varied charms was faithfully and beautifully portrayed—the Franz Josef Glacier, the wonderland of Rotorua, sword fishing at Russell, the Milford Track, and many another.

Most of us left the theatre with the hope that we ourselves might know more intimately this glorious land of ours, but alas! we are not rich tourists and must wait until the times are propitious.

OUR FIRST CAMP AT ROTORUA

After much bustle and hurry packing our bicycles aboard the train, and after regretless farewells to our friends, we settled down in our special carriage to the 4½ hours' journey. This quickly passed, and at 4.30 p.m. we arrived at Rotorua, and while those with bikes rode to the camp, the rest walked. Our camp site was on the Rotorua Racecourse; we slept in the Totalisator building and had our meals in the huge dining room under the main stand. After a good tea everyone bustled off to inspect the township of Rotorua, feeling like distinguished tourists. That night no one slept, the excitement and the cold being enough to keep Rip Van Winkle awake. So ended the first few hours of our camp. The following days were so chockful of amusement and sight-seeing that it would take more space than is available to relate all of our enjoyable experiences. On the amusement side the main attraction was the Blue Baths. Every day and night would find a group of Tech. boys enjoying a swim at these baths, partly due to the fact that we gained a concession here, as we did everywhere, two being admitted for the price of one.

On the sight-seeing side, Mr. Leeves had arranged a very attractive programme. Every other day we were away on some trip of great interest, especially those who were visiting Rotorua for the first time. We had bike and "hike" trips. Our first hike was through Whakarewarewa and up to the top of the big hill behind Whaka. Here we obtained an aerial view of Rotorua, and it was well worth the climb to view the township of Rotorua laid out in squares on the shore of Lake Rotorua, and surrounded on all sides by brown, rolling hills. Another fine morning we spent several hours inspecting the Government forestry site.

Most of our trips were accomplished per bicycle, and when the time came to pack for home, we had pushed our bikes over 200 miles. Those who were unable to secure bikes were not left out of the trips. They either walked or, owing to the generosity of the Rotorua Motors Limited, were able to find a seat in a service care, and ride there. The following are the trips we made by bicycle:

Fairy Springs (6 miles) where hundreds of beautifully-coloured trout are to be seen.

Tikitere (10 miles) which is a very weird place full of boiling mud holes, boiling pools and many other curious wonders created by Nature.

Lake Rotoiti (4 miles past Tikitere) which affords delightful swimming.

Blue and Green lakes, then on to Lake Tarawera and the Buried City, a trip of 20 miles. These four places hold rare attraction for all visitors.

Waiotapu and the Rainbow Mountain (40 miles). This trip was easily the best we had. The Rainbow Mountain with its many different colours gleaming out of its steep slopes, and the many wonderful sights one sees at Waiotapu, especially Lady Knox geyser, make a lasting impression, and one does not lose a second opportunity of seeing them again.

Mt. Ngongotaha (6 miles, then a 6 mile walk to the top). A really wonderful view of the surrounding country awaits one at the top.

The round trip of Lake Rotorua (36 miles) calling in at Hamarana Spring, where one spring sends up 16 million gallons in every 24 hours. We also called a halt to see the Okere Falls.

Another trip to Lake Tarawera. This time we spent a delightful four hour trip on the Lake.

Spare time was an unknown term for those three weeks. Besides the above trips, we were shown over the Mayor's farm; inspected the

numerous small baths of the Sanitorium in the Government grounds; played cricket with the Rotorua teams; attended the Maori regatta at Ohinemutu, a most enjoyable day, and last but by no means least, there was the big "tangi" or "beano." On the night prior to the eve of our departure for Auckland we celebrated our first camp at Rotorua. Competitions were played during the early part of the evening until supper. And what a supper! The cook had excelled himself, and the spread he put before us "would have put any wedding breakfast in the shade." Trifles, fruit salads, savouries, small cakes, large cakes, soft drinks, and many other delicacies which are available on great occasions only. It was noticed enviously by the boys that Mr. Park, who visited us that night, was the last to leave the supper table. During supper Mr. Park, reluctant to interrupt such a meal, gave a short speech on the value and the future of the camp, and presented Mr. Leeves and the cook, Mr. Noble, with a small token of appreciation from the boys of the camp. Mr. Leeves and Mr. Noble suitably replied, the camp captain also saying a few words. After supper we had a musical entertainment. Cornet solos, humorous conversations over the telephone, songs, mouth-organ solos, and community singing, with ice-cream served in between the items. Our celebrations finished with the singing of "Auld Lang Syne." The next day was spent in cleaning up and preparing for the closing of the camp, and it was with great regret that we boarded the train on Saturday morning bound for Auckland and home.

I would like to add for the benefit of those intending to join the second annual camp that they will have no regrets if they go into camp. They will have the grandest and the cheapest holiday they have ever had. The meals and sleeping accommodation are of the very best; also a great amount of freedom is given, such as is not allowed at any such camps. If in need of any confirmation of the above facts, ask any of the boys who attended the initial camp.

Also, on behalf of the boys present at the camp, I take this opportunity of again thanking Mr. and Mrs. Leeves for giving up three weeks of their own holidays in order to give us a wonderful time at Rotorua. Mr. Leeves' organisation and running of the camp made it possible for us to see everything in and around Rotorua at a considerably reduced rate, and also every boy was landed back in Auckland very much fitter than when we left.

—M. A. Wakefield, Camp Captain.

TIT-BITS FROM THE ROTORUA CAMP

While on fatigue duty peeling potatoes, a boy was heard to remark that he could not understand why there was so much unemployment in New Zealand when there were so many potatoes to be dug.

Most of the boys slept inside the building, but one morning one boy's bed was found perched precariously on the roof of the building. Nothing like fresh air.

One fine morning the camp was startled to hear that two young ladies were waiting at the front gate for J.A., but judging by the stream of boys running in the direction of the front gate, there was more than one J.A. in camp.

The news reached Mr. Leeves.

"I won't have this. Young ladies calling for my boys. What rot! I'll put a stop to this."

With a furious look on his face he joined in the rush to the gate, but alas! something was amiss. The girls did not waver at the sight of Mr. Leeves. They walked in the gate, and Mr. Leeves was seen returning rather crestfallen. The truth was that the two young ladies were J.A.'s sisters!

The joys of camping at Rotorua.

Isaac Soloman was overheard complaining to Mr. Leeves that there was not enough "pig" soup and pork chops on the menu.

The same boy, when he meekly asked why bacon was not cooked for breakfast, received this reply from the ex-army cook:

"Get out of here, you red-headed, lanky, good-for-nothing loafer. Brhh! I wish you were dead!" Then aside to Mr. Leeves, the cook was heard to say:

"He's a tourist, isn't he?"

Another boy who was unfortunate in not having a bike went over to the Tourist Office and asked for a map of Rotorua showing the routes taken by pig-wagons. He did not believe in walking far.

One of the first jobs at the camp was to fill our palliasses with straw, and a free fight ensued in the getting of it. That night one of the latecomers got into bed and as soon as he touched the palliasse he emitted a yell as if something hard was in his bed.

"Hey!" came from the other end of the building, "that's my suspender."

He had lost it in the fight for straw.

Four of the boys who had a great desire for plums, found that their bank balance was greatly diminished in the satisfaction of their stomachs.

This suggests the maxim: Shop fruit is cheapest.

—M.W.

THE VALUE OF SPORT.

Speaking at a farewell given to the members of the New Zealand team which was sent to the Empire Games, Lord Bledisloe uttered some very fine thoughts on the value of sport.

"This is admittedly a nation of good sportsmen and good athletes, and as such has a reputation to maintain. You gentlemen, as its chosen representatives, must, as New Zealand nationals, keep fit and in good training and do your utmost for your country's credit to achieve victory. But remember this is not only a nation of sportsmen; it is a nation of gentle-folk in the highest sense of the word. In that respect, the honour of this Dominion will, I feel sure, be safe in your keeping.

"Play the Game"

"The real value of sport lies in its effect upon our lives and character. It is not an end in itself. It puts to the test those physical powers with which a bountiful Providence has endowed us and gives health alike to body and to mind, whose vigour is so often atrophied and enfeebled through lack of adequate exercise. But it also puts to the test our moral equipment, our ethical values, our capacity to 'play the game,' and to observe the rules, to keep our heads in our dealings with our fellow men in our multifarious vocations and human relationships—above all, to be good losers as well as proud winners.

"If the playing fields of Britain have made great the British race (as has been asserted), it has been due more largely to the traditional spirit which has inspired and ennobled British sport than to athletic achievement or muscular dexterity. If there is one distinguishing characteristic of British athletes, it is that they know how to lose.

"And here lies the abounding virtue of the amateur. Monetary recompense for athletic prowess is apt to dim the ideals of the true sportsman and detract from the value to a nation of its love of sport and its pride in athletic pre-eminence."

THE VISIT TO J.C.L.

By the kind courtesy of Mr. J. W. Court, the managing-director of John Court, Limited, several parties of senior pupils of the college were invited to inspect the workshop and store of John Court, Limited. As on previous occasions no effort was spared to make the inspection thoroughly instructive and enjoyable.

Under the supervision of the heads of the various departments, parties were taken round, and the work under observation was explained and demonstrated. The students were encouraged to ask questions concerning the various machines and the processes that were demonstrated, to which answers were readily supplied. Indeed, it appeared that the greatest pleasure the students could give was to display sufficient interest to ask questions.

The mechanical aids to the factory processes were undoubtedly fascinating, and the wonderful adaptation of electricity to tools and machinery attracted similar attention. The visit to the store and office was made very interesting by an explanation of the control and organisation of the various departments.

On each visit the students were entertained by Mr. Court to excellent refreshments on the roof-garden above the store. At the conclusion of this a senior student, on behalf of the party, expressed thanks to the firm for the way in which the visit had been conducted, and the hospitality shown.

Subsequently, most of the students who paid this visit, wrote essays which showed how they had been impressed by all they had seen. These were sent to Mr. Court. Although no mention of any award had been made, the students were not unwilling to write such essays as some recognition of the courtesy of the proprietors of John Court, Limited. Several weeks later, however, the college was advised that Mr. Court had decided to award prizes of five shillings each to those whose essays had been chosen by a member of Mr. Court's family, who had read them. The judge of the essays has stated that, from them, she has learned many things that she did not know before. We wonder just what she has learned. The following were the lucky recipients:—Elsie Perrin, Betty Judge, Ethel Holden, Joy McGarry, Kathleen Goddard, Joyce Fahey, Lorna Mills, Norma Shaw, Althea Pallister, John McCormick, Morris Wakefield.

It has been suggested that in return for these very interesting and instructive visits, a party of the heads of departments and employees from John Court, Limited, should be shown around the College while the students are at their work. Although not so interesting as the visit arranged by Mr. Court, one such as this would be a suitable way of showing the appreciation of the students and masters.

RUAKURA SCHOLARSHIP

We congratulate T. Woodward of last year's Ag. 3 on gaining a Ruakura Scholarship for furthering his agricultural education. Woodward relingushed the scholarship and returned to school to study for the University Entrance Examination.

SMILES FROM OTHER SCHOOLS

Willie ate a cake of yeast
Before he went to bed;
"To-morrow I go fishing and
Must rise at six," he said.
When Willie's mother came at six
To still the alarm's wild pealing,
She found poor Willie fast asleep
Against the bedroom ceiling.

SOME HOWLERS.

They beat their drums or tum-tums.

In Christianity a man can have only one wife. This is called monotony.

Carbon dioxide is made from marble and hydraulic acid.

—Sacred Heart.

HIST! IT'S HISTORY.

"Father," said Frank as he was turning the pages of his history book, "How did the cave-dwellers keep warm in the winter-time?"

"Well, I guessed they used the mountain ranges."

—"Albertian."

"Where's Bill?"
"In hospital."
"What happened?"
"He came down a ladder ten minutes after it was taken away."

—"Tech Flash," Halifax.

"You gave the cloak-room man a big tip, old boy."
"Well, he gave me a good coat."

—Kelvin Tech., Winnipeg.

The soap-box orator was concluding his address:

"The fierce light of public opinion," he cried, "shall daily dog their very footsteps until they shallow the bitter pill and drink its deadly dregs!"

"My rose," he said, as he pressed his cheek again hers.
"My cactus plant," she said, as she encountered his stubble."

—Kelvin Tech., Winnipeg.

"Now see if you can laugh that off," said the fat man's wife as she finished sewing the button on his vest.

—The Challenger.

"Dear Teacher," wrote the indignant mother, "you must not whack Tommy. He is a delicate child, and is not used to it. At home we never strike him except in self-defence."

—"The Vulcan," Toronto.

She: "What sweet sounds come from the water to-night."
He: "Yes, the fish are probably running through their scales."

—"The Vulcan," Toronto.

VERY OBLIGING.

Dear Madam,—Please excuse Willie from school this morning. He fell in the mud, and by doing same, you will greatly oblige.

—"Tech. Flash," Halifax.

Two stuttering blacksmiths had finished heating a piece of pig iron and one placed it on the anvil with a pair of tongs.
"H-h-h-h-h-hit it," he stuttered to his helper.
"Wh-wh-wh-where?" asked the other.
"Ah, h-h-h-h-hell, we'll have to h-h-heat it again now."

—M.I.T., Voo-Doo.

Rightly famous in Mrs. McCombs,
Her name in this country just booms,
For at last in the State
After long weary wait
For women a Future now looms!

—Auckland Girls' Grammar.

Rastus: "Ain't you going to buy dis horse?"
Sam: "No, he's too thin."
Rastus: "Dat horse ain't thin. He's so fat on the inside, it pushes his ribs through the outside.

—"Tech. Flash," Halifax.

Master: "What is the main difference between our Parliament and the Witan?"
Pupil: "Please, sir, the Witan was a meeting of wise men."

—Sacred Heart.

Sambo: "Pete, Pete, wake up!"
Pete: "I can't."
Sambo: "Why can't you?"
Pete: "'Cause I ain't asleep."

—"The Vulcan," Toronto.

LIMERICKS.

A brawny old Scot from Montrose
Had pimples all over his nose.
When asked, "Is it simple
To grow a big pimple?"
He said, "Aye, they comes and they goes."

There was a young maid from Genoa,
Who went for a sail with Balboa.
The waves were unlawful,
The result was quite awful.
She came to the land of the moa.

There was once an old lady, God bless her!
Who tried to jump over a dresser.
She got but half way,
And there had to stay,
Caught on a hook, God bless her.

There was once a despondent duck,
Most fearfully down in her luck.
She sobbed, "This 'ere moulting
Is really revolting,
I seem to be coming unstuck."

Musketry Training at the Domain.
—By courtesy of "New Zealand Herald."

Musketry Training at the Domain.
—By courtesy of "New Zealand Herald."

There was an old man of Harrow,
Who carried his beard in a barrow.
"Now," he said, "that's not right,
So I'll set it alight."
The foolish old man from Harrow.

There was an Italian named Predo Letti,
Who had a vice, which was eating spaghetti.
Till his friend who was shady,
Eloped with his lady,
And now his sole thought is vendetti.

An inquisitive gent was Bill Leeter,
Who just couldn't believe his gas meter.
He pulled out a match,
And gave it a scratch,
"Oh! Good morning!" he said to St. Peter.

There was a young man from Dunedin,
Who stole a car from Glen Eden,
But his tricks went for naught,
For he was very soon caught,
And now he resides in Mt. Eden.

Il y avait une fois a Paris,
Une tres belle femme nommee Marie
Un homme dit "Whose who?"
Elle dit, "Scramez-vous,"
Donc elle frappee la nez of le mari.

There was an old sailor of Cork,
Who buried his mit in a fork.
While digesting his tea,
With his plate on his knee,
He looked at his hand and said "Morepork."

There was a young man named Bright,
Who once had a terrible fright,
It is s'posed to be said,
That he jumped out of bed,
And his hair turned snowy-white.

There was a fellow called Ghandi,
Who, it is said, had a liking for brandy,
One day he felt queer,
Cause he had too much beer,
And that's why his legs have gone bandy.

There was a young man of Glen Eden,
Who moved away to Mt. Eden,
But he said, "here,"
The milk is too dear,
So I'll have to shift back to Glen Eden.

There was a young man named Bill,
Who swallowed a dynamite pill.
He awoke in such pain,
That he said "never again!"
But that was the end of poor Bill.

N.B.—Com. 3A spent an afternoon composing limericks, and this is the result:—

A lady whose name was Miss Cecil,
Stowed away one fine day on a vessel,
Leaning over the rail,
She slipped through with a wail,
And now with a harp she does wrestle!

—E.R.

A modern young maiden called Betty
Walked right off the end of a jetty,
She fell down by a shark,
And the giddy young spark
Gaily took him in search of confetti!

—H.W.

A girl from the wilds of New Lynn,
Determined she'd flying begin,
She would copy Jean Batten
And start off to Saturn,
To take them sardines in a tin.

—C.C.

Down here is a teacher named D——is,
Who's known for the homework she gave us.
What with historic dates
And mouldy kings' fates,
We sigh, and ask neighbours to save us!

—C.C.

There was a young maid of 3A,
Who said to her comrades one day,
"I am sick of these sums,
So let's turn down our thumbs,
And for the next week or two stay away."

—J.V.

There is in 3A one called "Kitty,"
Who at school or at home is most witty,
Her sense of humour does stray,
And gets lost by the way,
And is often picked up in the city.

—J. McG.

There once was a girl, Phyllis Korn,
Who oft went to bed after dawn,
'Tis sad to relate,
But that girl met her fate,
When she died in the throes of a yawn!

—R.H.

In 3A was a girl called Sybil,
Who, one day in school, took a nibble,
But Miss H—erson saw,
And she said with a roar,
"I'll have what you're eating, please Sybil!"

—O.L.

Round the Forms

DIPLOMA (Girls).—To the accompaniment of falling chairs and heaving tables, the discordant braying of the strains of the sensational Skaters' Waltz, the four diligent Diploma girls devote their energies to the art of touchy typewriting, bewildering book-keeping, scrappy shorthand and elusive economics, while melodious peals of laughter and sonorous singing arise from the dismal depths below us. However, our den is easily converted into a skating rink of the most resounding type. In a luxuriously carpeted room (which has many little nooks and crannies for contraband goods), brightened by exclusive tapestry hangings and safe from all draughts, we specialise in a new kind of tea which is guaranteed to "bubble-opp" O.T.K. The production of this tea is, however, limited in supply and variable in demand.

COM. 3A.—There abides in a certain city of Auckland, a certain school called Seddon Memorial Technical College. And it came to pass that certain maidens therein were called upon to form a class for study. They met daily and worked together as Commercial 3A. And lo! they always did what was worthy in the sight of their taskmasters (and mistress) and they grew. And demands from the busy commercial world increased and the class numbers dwindled. And still there yet remained several holy keepers of the law, namely prefects and councillors. Then on one day of darkness and gloom, a rumour was heard in the land, that a certain Joan of the family of Stanley was to depart from the midst of the children of the Technical College. And it came to pass that Joan mourned saying, "Woe is me, I am filled with sorrow that I am fated to leave you." and she departed hence.

COM. 3B.—Although our ability in shorthand and typewriting is somewhat astonishing, our achievements in dressmaking are remarkable; indeed, so remarkable that, to us, fell the high honour of providing the teachers with comfortable cushions. In the history examination we showed exceeding brilliance. Many and varied were the answers to the questions. One bright scholar declared that "King Alfred was the last of the Great Barons."

COM. 2A.—Welcome, Readers! Peruse the notes concerning Commercial 2A. As our name suggests, we are very clever and studious, our work being a credit to our efforts. But alas! Our tongues are too eager and ready to help our pens, and are thus accumulating impositions at a rapid rate. But it must be known that we are the exception to the rule—"Empty vessels make the most sound." At sports we excel, basketball especially, as we succeeded in winning the form matches by beating our opponents by a score of 15—7, though two of our regular team were absent.

COM. 2B.—We have at present, and have had, some very strange specimens in our class, but the strangest of all came, in some unaccountable way, in the shape of a most terrifying centipede about six inches long, which, however, came to an untimely end at the hands of a master who heartlessly put an end to its ambitious journey down the desks (the centipede, by the way, was preserved in formalin, an

awful-smelling substance). At the time of writing we have just finished our examinations and some very humorous answers have been submitted for the history questions. It seems that Kororareka was either a flag-staff, a Maori chief or a canoe.

COM. 2C.—Many amusing incidents have occurred in our English lessons. One day we were asked for an explanation of "artificial." One brilliant pupil put up her hand and said: A definition of artificial is "artificial teeth." There were loud bursts of laughter and the brilliant scholar sat down much abashed. Upon another occasion the class was asked, "What is a buttery?" Immediately hands went up. One wavering hand was picked out and the answer came, "A buttery is a place where butter is made!" (subdued giggles.) In a lesson on "Richard Carvel," one girl in reading described Mr. Carvel's horse as a "green" one instead of a "great" one, and went on reading blissfully, quite unaware of her mistake until the enjoyment of the class became too obvious to be missed any longer even by the most unobservant soul.

COM. 1A.—"Aren't they good girls!" quoth Mr. Inspector as he gazed around the class of quiet pupils. And really we deserved it—for once! Whenever we are required, the sounds of our never-ceasing talking and laughter provides a safe guide to us.

COM. 1B.—

Com. 1B's are glad and bright,
They know that they are always right.
In sport and lessons they excel,
All thoughts of failure they expel;
Amongst their number some are tall—
A few of them are really small,
But work in size is all the same,
They always—always! play the game;
But time is short and so to you
Com. 1B will say adieu!

THE AGRICULTURE CLUB.

With the help of Mr. Davis, the agriculture boys this year successfully organised the Agriculture Club. The following officers were elected upon the first meeting: J. Burgoyne, president; S. Jones, secretary; Jean Tyler, assistant secretary.

We have already held two shows this year, but our main show is to be held in November in the Assembly Hall.

In the last Winter Show, he had several exhibits of vegetable crops grown by the boys, and from these we earned quite a large number of prizes.

One of the most instructive and interesting meetings held during the year was when Mr. Falla, ornithologist of the Auckland Museum, gave a lecture on "Birds," in particular the sparrows and finches, and their agricultural importance. Describing many birds and their feeding habits, he gave us a good insight as to which birds are beneficial and which harmful to crops. He also emphasised the fact that an enormous amount of insect life is destroyed by birds in the nesting period.

A branch of our work, which aims at the encouragement of gardening among the pupils of the school, is the sale of flower and vegetable seeds at a very low rate.

A feature of the club which we hope to develop further is the establishment of groups dealing with different phases of agricultural and horticultural work.

DOMESTIC

DOM 3.—Be it known to all men that we, the girls of Domestic 3, are given the most important of all trusts—the digestive system of the Principal and Heads of Departments, and as yet we have received no complaints whatever. What greater proof could there be of our culinary ability? We are afraid, though, that some do not fully appreciate our cooking, for, on one occasion when we were occupying a room directly under the kitchen, a loud bang was heard above us: "A date scone, I suppose!" casually remarked the teacher. Of course, we do not claim to be perfect, and we admit that even we make mistakes sometimes. For instance, one girl serving at the soup window of the cafeteria, not noticing that she was serving a teacher said: "Come on, cut along. Give some one else a turn!" much to the teacher's astonishment and, we may add, the girl's discomfiture. Another serving pies was asked what the pies contained: "Rabbit and veal," she replied readily, and was quite shocked when the senior girl nudged her and whispered with a knowing glance, "Chicken and veal, you silly!" At Home Science we were invited to prepare a lunch of 700 calories. To the unfailing question "how?"—the answer came quickly and not uncertainly, "Use your brains!" We are beginning to feel that some of the answers supplied to inquiries are quite unwarranted. To one girl's polite query as to whether she could "leave the room," the retort of the teacher was to the effect that she "should hate to think of her taking it with her!" And yet, in spite of these withering remarks and horrible innuedos we still toil on, for without us where would be those beautiful garments in which appear our actors and actresses in the school concert?

DOM. 2A and 2B.—Have you ever tried to explain the word "gargle"? If you followed the method recommended by one of us for the process, you would "get some water in the mouth, half swallow it, breathe out and make a noise in the throat! We felt that we could not better that explanation, so we went home to practise! To those

unfamiliar with "Beaumont" we must explain that in it is a lesson on evaporation, and one learns there how to minimise it if one wishes to become a successful gardener. We all followed step by step till at the end we felt that if ever we had a grasp of a subject, that subject was evaporation! Imagine, then, our horror and dismay when one of our number informed us that, in order to prevent undue evaporation, we must cover our gardens with pieces of timber! We wonder how she would have liked to be a cabbage under the circumstances!

DOM. 1C and 1D.—Never were there such enthusiastic and industrious girls as Domestic 1C and 1D. As proof of our industry, let us quote the case of the girl who had nearly finished knitting her jumper. As the days grew colder, more enthusiastic and industrious she became. Only one sleeve remained. Surely she could utilise to advantage some of the English period! But the cold eye of the irate teacher was upon her, and confiscated was her knitting—for one month! The only consolation is, that, though the jumper was too late for this winter, it will certainly be early for the next. On reflexive pronouns, we are experts. Having one day exhausted the orthodox list, one of our number, in search of more, suggested "help-self." When we realised its origin, we made no attempt to restrain our mirth.

DOM. 1 E and 1F.—Sport, is not the only thing at which we excel, for we realise that we must work if we are to make good use of our schooldays. We have formed a club, members of which are known as the "Happy Helpers."' We work for the poor and needy, and have already knitted a number of jumpers, scarves, babies' garments, and patches.

HOWLERS

Dust is mud with the juice squeezed out.

A widow is a wife without a man.

Acrimony is another name for marriage.

Noah's wife was Joan of Arc.

Queen Elizabeth never married. She had a peaceful reign.

William the Conqueror was the first of the Mormans.

The king wore a scarlet robe trimmed with vermin.

A cat is a quadruped, the legs, as usual, being at the four corners.

Gravity tells us why an apple does not go to heaven.

Ice is water that went to sleep in the cold.

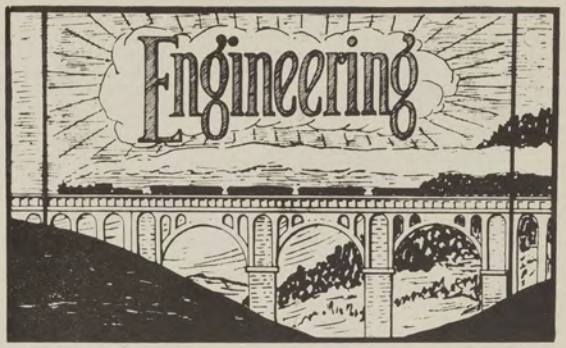
A vacuum is nothing shut up in a box.

Geometry teaches us to bisex angels.

Men are what women marry.

The sun never sets on the British Empire because the British Empire is in the East and the sun sets in the west.

A blizzard is the inside of a fowl.



E. 4.—Some notes received but regret they could not be deciphered. —Editor.

E. 3A.—Once again we present to you the salubrious efforts and achievements of E. 3A. We must apologise for the crude manner in which these form notes are compiled, but unfortunately our editor, together with two other stalwarts, has left us in order to assist Mr. Forbes in the management of the postal department. To quote from the works of the aforesaid editor, "Our attainments are not limited to the intellectual side, however," for among them was the defeat by E. 3A, together with Accountancy 3, of the rest of our college in a Rugby "brawl," which Mr. Scott kindly condescended to referee.

E. 2A.—The intelligent E. 2A wish to greet thee after a year of hard work. It is only natural that our name tops the list of second year forms. We have not only achieved great wonders on the intellectual side, for our name is held in high esteem on the sports field.

E. 2B.—Most of our nerves give out when Mr. Ad—s walks into the room, moustache bristling, with a fiery look in his eyes and a heavy ruler in his hand, demanding that everyone should file past him with their homework. Or else, perhaps, when Mr. W——r, after someone has turned on the tap and sprayed all his books and case, bends down behind his desk and appears with a black object in his hand, only for it to turn out, not the strap, but his slide rule. Also the way Mr. Ad—s bangs his ruler on the desk when a person is looking the wrong way, causing that individual to jump several inches in height: the height, of course, depending on the condition of his nerves after two periods of trying to watch Mr. Ho——s through the back of his head, while changing the gears on his lathe the wrong way.

E. 1B.—In metalwork we have quite a happy time, with the banging of hammers, and the scraping of files, and we work away with the intention of someday being great engineers.

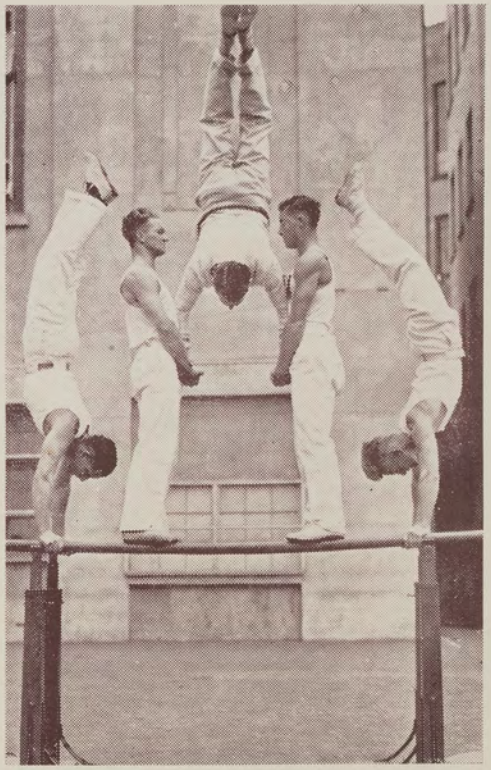
E. 1C.—In an English lesson Mr. S. asked if we could substitute a single word for the phrase underlined. The sentence was: "John had a position **for which he did not work, and received a good wage.**" Student So-and-So: "Please, Sir, a Relief Worker." A question that was asked by one of the students, and Mr. C. could not answer it. "Didn't Edward tame the spider in the cave." We'll give you till next year to find the answer.

E. 1D.—When Jones was asked if he had done his homework, he replied: "A banana squashed all over my homework book, and I had to throw it away." (What, the homework or the banana?) In fact, the only homework excuse that has not yet been given is: "The baby ate my homework paper up, sir!"

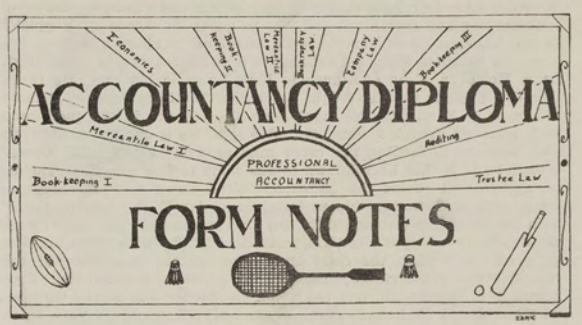
Still Pushing Ahead

M.E. 2.—We take it in turns, two at a time, to come down and help Mr. Sinton in overhauling cars. For the two fortunates, ordinary school time-table is dropped for every afternoon in one week, and then next week, the next two on the roll take the places. One of the peculiar happenings in class:—A member of the class was laughing in class, and as usual "about nothing." It was science, and the teacher complimented that member by calling him "hyena": names do have a way of sticking.

M.E.1.—We have learnt something about paper: 1. Write on it. 2. Use it for a missile or for a dart. Some members of the class—none of the Mac's—use the paper for dart or missile without writing on it. **Note.**—Paper is used instead of ink for tribal warfare, ink being very costly to remove according to school rules, which say: **One Ink Throw, 10/-** (if thrower caught).



Perfect Symmetry!
—By courtesy of "Auckland Star."



ACC. DIPLOMA (Boys).—Although the members of this institution total only three, we have upheld the record put up by last year's class in sport, yet we have still to prove that the three of us can pass the five subjects that we are studying for. They are:—

1. **Company Law,** which enables us, through the discovery of loop-holes in the Companies' Act, to float companies which, invade the Act, secure the hard-earned saving from imprudent investors in order that the directors, besides earning large sums as directors' fees in such companies as the North Pacific Exploitation Company, are able to spend their long holidays sailing around the Pacific in a magnificent yacht at the investors' expense.

2. **Bankruptcy Law.**—We study this law in order that when teachers and friends borrow money from us, and the age of recovery past, we may, through our knowledge of the law, take legal proceedings against them and recover our money by seizing their entire possessions, including future examination papers, and selling them. (Often it occurs that we receive more than our original debt.)

3. **Mercantile Law.**—All persons desirous of entering into any contracts whatsoever, should without fail make an appointment at Room 34A. ("Come up and see us sometime.") From our wily teacher we have learnt how to receive goods and chattels on credit, and after receiving them we can evade payment for such by showing that our mentality is that of infants.

4. **Economics.**—We have been told this deals with the study of money, but up to the time of writing no money of any description has been given to us for the purpose of furthering our studies. The only money we have handled is that which has passed from the safe-keeping of our pockets into the school coffer. We have learnt what money was, is, ought to be, should not be, and that gold is not used in circulation now, but we are unanimous in the opinion that if we were given gold its circulation would be immediate and effective.

5. **Book-keeping.**—Is the name given to a system whereby accounts of all legal transactions of a business are kept (illegal transactions are kept in books which are usually destroyed). At some time during the year a statement is made oue, which, invariably shows a profit, presents an account for the satisfaction of clients and for the confusion of the income tax collectors.

ACC. 2A.—Our form-master is an ancient and studious master of book-keeping and shorthand, and who to quote the words of an equally famous master, "Saw service with Boadicea against Caesar." His favourite pastime, when not talking, is brewing tea over a small spirit lamp. However, if he continues to burn holes in his case, we think that this popular pastime might cease. Our brainiest scholar, without exception is Ferrif. In the lunch-hour if he is not in the tuck shop he is learning French in some secluded spot. He is one of the old type who believes in feeding the inner man as well as the mind. Clever though he is, he has been known to ask many foolish questions. During an agricultural period the question, "Write down the percentage of water, ash, and combustible material in a plant?" the "master-mind" with the air of one who knows, raised his hand and chirped out, "Please sir, do we have to put the total percentage?" The poor little lad was quite horrified when the class burst into raucous laughter. For the rest of the day, Ferrif held his peace. Another aspirant for high honours, is Greenough, our champion hoe-hurler and spade thrower, who has defied challenges from all classes. Greenough is very much out of work these days, as there are not very many suicide candidates. At home, however, he has been striking terror into the hearts of his parents. There is no more dangerous opponent than Greenough, plus a long-handled hoe.

ACC. 1B.—Our form is a band of innocent angels. Let me introduce some of them to you:—

Willets.—He is our "Max Baer," who guards us with affectionate care.

Mattson.—Who when asked a question stares in horrified dismay at the teacher.

Thompson.—Who is the "spark plug" of the class.

AG. 2 and 3.—Each of us has spent one week of the term in the study of practical agriculture at Miller's Farm, Glen Eden. Amongst other things worthy of notice is the sight of a well-known lad who, asked to put some wire around a gate to prevent its opening, dutifully twisted the iron thread around the hinge. This person was also placed in a rather conspicuous position upon his falling from a garbage lorry. Quite occasionally, we have spent a few industrious hours at the intensive plots at Benson Road.

AG. 1.—We are happiest and work hardest on Tuesday mornings, Wednesdays and Thursdays of alternate weeks, when we are at the school gardens at Benson Road.

G.W.D.

The good-natured coach of the Second Eleven
Is usually in his "Seventh Heaven"
When a Hindley boy is making a run.
He laughs, he jokes, he has great fun.
But when his team is in the rut,
He shakes his head and says "Tut, tut!"
He then goes in and plies the willow,
To the dismay of many a Well'sley fellow,
And when he has made his accustomed score,
He returns to the pavilion, smiling once more.

—W.K., A. 2A.

TYPOGRAPHY 1-2&3

FORM NOTES FOR 1934

TYPO. 3.—The monotony of class routine is often broken by some amusing period. One humorous episode occurred when we endeavoured to put our thoughts into writing. Serious prose and humorous prose proved the most popular subjects, and as we have received no intimation as to who won the competition, we conclude that there is still hope for our literary efforts (?) We hope our anxiety will be dispelled at the appearance of the first copy of the "Seddonian."

TYPO. 2.—In the first term some "smart" lad whilst passing Room 1, took it into his head to lock the door. (The key was in the lock so the temptation must have been too great.) Mr. Thompson's class were imprisoned all the interval, and we being the unfortunate form to be near at hand, were blamed. It was not long after, however, before the culprit was found and dealt with.

TYPO 1.—T. 1, the budding Caxtons of the college specialise in boys who rejoice in the same surnames. For example, we have three Clarkes, two Jones, and two Mitchells in our form.

W. 3.—Woodwork 3 claims to be a form unique in the history of the school, because every member of the class belongs to the same house. Of course, we do not forget mention that there are but three boys in W. 3.

Winter Sports

BASKETBALL RUGBY BOXING
GYMNASTICS

BASKETBALL.

SCHOOL MATCHES.

Three matches with other schools have been played this year. On their home court the school A and B teams were winners against both Otahuhu Technical High School and Pukekohe Technical High School. The visit to Hamilton took place under most unfavourable weather conditions, for which, however, the hospitality of the Hamilton Technical College more than atoned. Results of the matches: Hamilton A, 14; Seddon A, 5; Hamilton B, 4; Seddon B, 7.

SATURDAY MATCHES.

The school is represented in the Auckland Basketball Association by three teams in the following grades: Second Grade A, Second Grade B, Third Grade.

Two girls of the school, A. Pallister and J. Lynch, are to be congratulated as members of the Auckland Second Grade team.

FORM MATCHES.

These provided some very good basketball, keenly contested, and as keenly barracked. Com. 2A, the winners, defeated Com. 3B in the finals by 15 to 7.

Perhaps the most interesting and amusing basketball of the season was the match between women teachers and girls of the School Council, in which the latter, somehow, were victorious by 11 goals to 5.

RUGBY FOOTBALL.

FIRST FIFTEEN.

Team.—Wakefield (captain), Thompson, Fry, Rawnsley, Lord, Tweedie, Thorpe, Finlay, Burgoyne, Binns, Taylor, Galloway, Turnbull, Borich, Duncan, Nelson, Pearson, Pickering.

At the commencement of the season our coach (Mr. Titheridge assisted by Mr. Scott) was very hopeful of being able to drill us into a good fifteen. Our first game against King's justified such hopefulness, the forwards playing a great loose game, although not very tightly in the scrums against heavy opposition, while the backs showed promise of developing into a good combination. We won the match, 14—0. Wakefield, three tries, two conversions, and Finlay one try.

Mt. Albert were our next opponents, the ground was a mud pool and the game was a battle of the forwards. Our forwards were again up against good and heavy opposition, but they held their own, and were very unlucky in not scoring from several of their rushes. We were defeated, 9—0, but not disgraced.

BASKETBALL A TEAM.

Back Row: Mavis Glassey, Connie Watters, Flora Te Papa, Anna Irvine, Margaret Taylor.

Front Row: Bonnie Stubbing, Rhona Tilby (vice-capt.), Althea Pallister (capt.), Jessie Macdonald, Miss Adams.

—S. P. Andrew.

BASKETBALL B TEAM.

Back Row: Evelyn Pullan, Jean Reeves, Gwen Baker, Gretha Clegg, Gladys Lockley, Buelah Ellis.

Front Row: Miss Adams, June Hill, Olive Cooper (capt.), Molly Mullins, Jean Steel, Nora Macdonald.

—S. P. Andrew.

We tackled Auckland Grammar B next, defeating them 13—5. Wakefield, two tries and two conversions, Borich one try. Both backs and forwards did not play up to their best as tight packing in the scrums and combination among the backs was lacking. Several, however, played good individual games.

After we had had a bye we played the Grammar A team, and with the captain on the injured list we had hoped for a wet day, and we certainly got it. Again, as in the Mt. Albert match, it was a forward battle, and our forwards did their work with a will, but when the Grammar forwards got near our line the Grammar backs founds gaps in our defence, and scored three times. Grammar won, 9—5. Borich and the forwards did not play up to their best tight packing in the scrums.

Next came a spell of four weeks, due to striking the bye at the beginning of the second round, and wet Saturdays. During this untimely spell owing to the third grade team becoming defunct, our practice games were seriously interfered with, with the result that when we played our next game against Grammar A, combination among the backs was conspicuous by its absence, and it was only by the sterling play of the forwards, Galloway and Turnbull, shining in the line-outs, and good individual defending games by some of the backs, that the score against us was only 11—0.

This game was played on a Tuesday, and on the following Saturday we made our biennial trip to Hamilton, and as usual for a Saturday, it was raining, and we were without our big forward, Galloway, who had played a great game against GrammarA. For the first spell we played against a strong wind, and the forwards, who had been given strict instructions to keep the ball to themselves, persisted in knocking the ball back. The half-back continued the bad work by attempting to pass a very slippery ball to the five-eighths, more often than not the ball went begging, and the Hamilton forwards took advantage of this and scored. They were unlucky in not scoring more, but Thompson at full-back did some good defensive work which was quite a change for him. In the second half after receiving strong advice from the coach, the forwards chased the ball from the kick-off, and for the remaining half-hour we were only once or twice within our own half. Hamilton, with a lead of five points, were well and truly on the defence, but our forwards were not to be denied. They took the ball over the goal line for Finlay to pounce on it and score. Thompson, with a splendid kick piloted the ball over the bar after it had scraped the cross-bar. Backs and forwards did everything but score, the greasy wet ball made handling very difficult and, coupled with the rock defence Hamilton were putting up, we could not add further points. Thus the game ended in a draw, 5—5.

Our next competition game was against Mt. Albert; we were defeated, 31—6. The opposing forwards were too strong for ours, and the less said about the defence of the backs the better. However, we made amends for this by scoring the two best tries scored on the day. They were practically identical, both movements starting on one side of the field, about the half-way line, several forwards handling the ball before it reached the line of backs, where the ball continued its way to Fry on the wing, who by straight and determined running, forced his way over the goal-line on the opposite side of the field to where the movement started.

The final game of the competition was against King's, and as Pukekohe were due to play us on Tuesday, we set out to regain our lost combination. We certainly found it. The forwards playing a fine, loose game, and feeding the backs from the scrums and line-outs

enabled the backs to throw the ball about. As the result of regaining our confidence and combination, we scored eight tries. Borich 3, Wakefield, 2, Fry 1, Finlay 1, Tweedie 1. Wakefield converted 2, making the score 28—0.

The last game and the second big match of the season was played on the Domain against Pukekohe Technical High School. It was the best and the hardest game we had played. Play fluctuated up and down the field, first the greens taking the play downfield only to be forced back by the blacks. From the kick-off the green backs got going and were unfortunate in not scoring several times, but Pukekohe were very sound in defence and our movements were not finished mainly due to the fact that a few forwards were not putting their weight into the tight scrums, Borich being the main offender, and by the time the backs did get the ball, the Pukekohe forwards had got round to make other backs. The green backs made several good breakaways, but faulty handling ruined chances of scoring. With the play running from one end to the other, the excitement was very high, and was still higher in the last five minutes, when the green backs made determined runs in the attempt to pierce the Pukekohe defence. At the last minute the ball came from the line-out, Wakefield cut through but was pulled down, Nelson picked the ball up and barged over, but the referee ruled him offside. So the game finished without any score being registered.

Results: Versus King's, won 14—0; v. Mt. Albert, lost 0—9; v. Grammar B, won 13—5; v. Grammar A, lost 5—9; v. Grammar A, lost 0—11; v. Hamilton, drew 5—5; v. Mt. Albert, lost 6—31; v. King's, won 28—0 v. Pukekohe, drew 0—0. Points for, 71, against, 70.

THIRD GRADE TEAM.

When arrangements for the football season were being made at the end of the first term, the prospects of the Third Grade —at least, as far as numbers were concerned—seemed very bright. The beginning of the second term saw a very different story, because, during the vacation, a good many prospective Second and Third Grade players left. Consequently, from the beginning there were no boys to spare, and, on several occasions the First XV. turned out without an emergency.

The Third Graders retired from the competition at the end of the first round, having played four matches and won one of them. We were beaten by Auckland and Mt. Albert Grammar A teams, by a good margin, were just beaten by Otahuhu Technical, and registered a glorious win against Sacred Heart Second XV., which peculiarly enough, had been beaten only 3—0, by the very strong Auckland Grammar team.

Outstanding players in the team were: Fry (captain), Tweedie, Taylor, Duncan, Pearson and Waldron, who graduated to the First XV., and Malyon, who was unlucky enough to break a collar-bone in the match against Otahuhu. Sometime members of the team were: Fry, Tweedie, Taylor, Duncan, Pearson, Waldron, Malyon, Massicks, Marshall, Mitchell, Anderson, Woolley, Manning, Cope, Ritchie, Box, Cox, Francis.

FOURTH GRADE TEAM.

L. Naughton, I. Jensen (captain), Wallace (vice-captain), Emus, Oldnall, P. Randrup, McLean, Taylor, C. Clist, R. Chappell, Graham, Jones, Campling, Mason, Bentley, Casey, Finlay, Evitt.

Summary of games: Versus Auckland Grammar A, lost 36—0; v. Mt. Albert, won 9—6; v. Sacred Heart, lost 6—3; v. Takapuna, won 6—0; v. Auckland Grammar, lost 8—3; v. King's, draw 0—0.

Our first game found the team not in full strength. Several good players were injured in practice, so we found it hard to get a really

good team. However, we soon settled down, as shown by the next game, into a really good, little team. Sacred Heart were lucky to win. At half-time the score was 3—0, to us, but Sacred Heart scored two lucky tries in the last few minutes. After beating Takapuna, on a teeming wet day, thirty-one to nil, we found it necessary to play-off again. This time, however, Takaupna were in full force, winning by only six points to nil.

Auckland Grammar had one of the biggest surprises of the season when they found the S.M.T.C. leading 3—0 at half-time. But as with Sacred Heart, history repeated itself, and Auckland Grammar scored in the last few minutes. With only a cricket team against King's, it seemed a certainty to the maroons, but with every boy playing his best game, we managed to make it a draw.

The Hamilton Visit.

Team: Naughton, Jensen (captain), Emus, Oldnall, Wallace (vice), Randrup, McLean, Clist, Taylor, Marshall, Jones, Campling, Cope, Casey, Graham.

Arriving at the Hamilton station in a drizzling rain, our chances seemed very hopeless. Our ideal day would have been a fine day.

Still we hoped for the best, and we were taken to the Hamilton Technical College, where we were met by the teachers and boys of the College. We had an enjoyable dinner, after which we were taken in a bus to Rugby Park. At approximately one o'clock, the teams lined up, Auckland Tech. winning the toss. The wet weather apparently suited the Hamiltonians, who soon had their forwards dribbling over the line to score. It seemed as if the score would remain, 9—0, until with a good kick Randrup put over a penalty kick. From a scrum on Hamilton's line, the ball was hooked very cleanly by Clist, McLean taking the slippery ball well, to give a good pass to Wallace, who in turn, passed to Jensen, who quickly gave Emus the ball, and with a good turn of speed, he was over. Randrup failed to add the points, and then time was called.

FIFTH GRADE A.

The Fifth Grade A team made a very satisfactory showing, finishing as runners-up in the grade, and going very close indeed to the highest honours of the championship. A formidable attacking combination was developed, and some very bright football was witnessed.

Among the backs, Vaughan and Morrison, were outstanding, and put up an excellent performance, while Gray, as half-back, improved considerably towards the close of the season, and did quite well. There was a distinct weakness in the full-back position, and unfortunately the few points scored against the team were of great importance as far as match-winning was concerned. Later in the season Murphy was taken from the forwards to become full-back, and performed very creditably there. Abbott also shone occasionally.

Lund proved an excellent leader of the pack, which worked hard and did their duty nobly as hard-working forwards: the consistency of their work enabled the backs to have good opportunities. The outstanding performance was a win of 71 to nil against Dilworth, which must be a College record. The determined and constructive play of Gray, Vaughan and Morrison, contributed largely to the overwhelming victory, and Morrison kicked ten goals from all sorts of awkward angles. Generally speaking, all players gave of their best, handled the ball cleanly and "followed up well."

Team: Murphy, Otter, Morrison (captain), Patterson, Vaughan, Gray, Harris, Anderson, Lund (vice-captain), Williams, Poole, Marsden, Bolton, Archibald, Ward. Also played Annan, Abbot, Smith, Gibson.

Matches played: Versus Auckland Grammar, lost 11—13; v. Sacred

Heart, won 13—5; v. King's College, won 44—0; v. Mt. Albert Grammar, lost 6—11; v. Takapuna Grammar, won 3—0; v. Dilworth, won 71—0; v. Otahuhu, not played owing to weather; v. Mt. Albert Grammar (second round), won 15—0; v. Auckland Central Primary Schools' Representaties (winners of Roller Mills Shield), won 19—0. Total: Matches played 8, won 6, lost 2, points for 179, against 29.

In the first match, against Auckland Grammar, a whirlwind start put us 11 points up at half-time. Misfortune and a certain amount of carelessness allowed Grammar to head us off soon after commencing, after which the game was evenly and keenly contested.

Against Sacred Heart, a stout forward tussle ensued, with good tries scored by Williams, Gray and Morrison.

In the King's match, the backs showed to great advantage with a dry ball. Abbott and Vaughan had a field day, scoring five tries and four tries respectively.

As good a contest as one could wish to see was the match against Mt. Albert, both sides playing good football, with Mt. Albert, by clever opportunism scoring a win in the last few minutes. Five points down at half-time, our forwards launched a fierce attack which put them in the lead only to lose it again at the end.

Played in pouring rain at Victoria Park, a good contest resulted in victory in the last stages when Otter scored a skilful try.

The match against Dilworth resulted in a win by the large margin stated. Backs and forwards combined well and varied their attack so as to bewilder the opposition. Most scoring was done by Vaughan (6 tries), who played a sterling game, Gray (3), Harris (2), Patterson (2), while Morrison scored 23 points by means of 10 conversions and a try. Though vanquished, Dilworth resisted stoutly till the end.

Continuous rain and flooded grounds rendered play out of the question in matches against Otahuhu, and in the second round matches against Auckland Grammar and Sacred Heart. In the match against Mt. Albert Grammar, the tables were turned on our opponents and a well-deserved win was scored, Lund, Poole and Morrison scoring tries, Morrison converting three.

The final match of the season was played against Auckland Central Primary Representatives at the Domain, the College team winning easily. Morrison and Vaughan each scoring two tries and Otter one.

For four seasons now the Fifth Grade team has either won or been runners-up in the grade.

FIFTH GRADE B.

Although a full team was hard to get we had some fine and interesting games on Saturday mornings. This season there were not many Tuesday afternoons fine, and this hampered our progress considerably. We have all enjoyed the matches on Saturday morning, and are sorry that the end of the season has come. The most improved players were. Hayter, Harris, Smith, Birss in the backs, and Gibson, Keeping, Mortenson, Greenwood, in the forwards.

List of matches are as follows: Versus Grammar B, lost 0—20; v. Mt. Albert, drew 6—6; v. Grammar C, won 6—0; v. Grammar B, lost 3—13; v. Mt. Albert, won 24—3; v. Grammar C, lost 0—3. Games played 6, won 2, lost 3, drawn 1.

The team was: Sergeant (captain), Smith, Keeping, Harris, Hayter, Hirst, Birss, Andrews, Gibson, McCowatt, Ward, Mortenson, Greenwood, Annan, Lee, Inkster.

FIRST FIFTEEN.

Back Row: Taylor, Thompson, Marshall, Pearson, Lord, Binns, Jensen.
Middle Row: Duncan, Tweedie, Thorpe, Wakefield (capt.), Borich, Fry, Mr. Titheridge.
Front Row: Finlay, Clist, Burgoigne.
Absent: Turnbull, Nelson, Pickering.

—Schmidt Studios.

FOURTH GRADE A TEAM.

Back Row: Findlay Oldnall, Chappell, Taylor, Naughton, Evitt, Bentley.
Middle Row: Emus, Randrup, Wallace, Jensen (capt.), Clist, Jones, Mr. Webber.
Front Row: Sergeant, McLean, Campling, Casey.

—Schmidt Studios.

SIXTH GRADE A.

The Sixth Grade A team had a very successful season this year, and finished up by sharing the championship honours with Auckland Grammar. Throughout the season there was not a slacker in the team, and the enthusiasm of the boys, both when practising and playing, was great.

The most successful forwards of the team were Selwyn, Jennings, De Maus, Brennan and Riddell. The most successful backs, Bundock, Robinson, Jones, Yates and Howard. McCook and McLennan both ran each other close for a place in the team, and there remained very little to choose between them.

Games played: Versus Auckland Grammar, drew 0—0; v. Kowhai Junior High, won 12—0; v. Sacred Heart, won 9—0; v. Takapuna, won 3—0; v. Mt. Albert, won 15—0. Second Round, versus Auckland Grammar, lost 3—6; v. Takapuna, won 6—0.

The team played every game in good spirit, taking both victory and defeat in a sporting manner: their conduct was a credit to themselves and to the School, but they do not overlook the fact that they owe a great deal to the unfailing efforts of the coach, and fully appreciate the same.

Team: Bundock (captain), Yates, Howard, Jones, McLennan, McCook, Robinson, Nicholson, Muller, Veart, Riddell, De Maus, Selwyn, Jennings, Johnston, Brennan, Montague.

SEVENTH GRADE RUGBY.

This year two Seventh Grade teams were entered in the competition, but as a result of falling off in numbers it was found necessary to withdraw the B team. With about twenty available players it looked an easy task to pick a good team, but as in the previous year a lack of forwards made matters difficult, consequently the Seventh Grade team had several weaknesses which were hard to rectify. However, the team made quite a good showing, and when beaten it was always after a hard struggle, and only by a small margin.

Among the forwards Davies was the most outstanding player, while Taylor, Howe and Brigham, improved considerably. In the backs Lenihan proved himself a useful five-eighths or half, Gearing (captain), a tricky three-quarter and MacRae, a reliable full-back.

The following games were played: Versus Otahuhu A, lost 3—0; v. Takapuna A, won 3—0; v. Sacred Heart A, lost 8—6; v. Auckland Grammar A, lost 8—0; v. M.A.G. A, won 6—0; v. Otahuhu, won 10—7; v. Takapuna, lost 6—0; v. Mt. Albert, lost 3—0.

EXCHANGES.

The Editor acknowledges with thanks the receipt of the following School Magazines: "Quill and Scroll" (magazine of the International Honorary Society for High School Journalists, U.S.A.), Sacred Heart College, Takapuna Grammar School, Auckland Girls' Grammar School, The Timaruvian, The Index (Wanganui Technical College), The Albertian (Mt. Albert Grammar School), Review (Wellington Technical College), Reo-Mano (Waihi High School), The Haurakian (Thames High School), The Dilworthian, The Hamiltonian, Tauranga District High School, Taniwharau (Hamilton Technical High School), Chronicle (Auckland Grammar School), The Postman (Correspondence School, Education Department), Palmerston North Girls' High School, Diocesan High School Chronicle, Raukura Rotorua (Rotorua High School), Vantech (Vancouver Technical School), The Tech Flash (Nova Scotia Technical College, Canada), The Vulcan (Central Technical School, Toronto, Canada, Kelvin Technical High School, Canada.

1933 COLLEGE GYMNASTIC CHAMPIONSHIPS.

The following boys qualified and entered for the College championships. Seniors, Robinson M. 4, Hiscock E. 3, Anderson B.T. 3. Juniors, McAndrews B.T. 2, Barker M.3, Stevenson B.T. 2.

To eliminate specialisation the competitors are judged by their performance on all parts of the gymnastic apparatus.

The seniors finished in the following order: Robinson 1, 189½ points; Hiscock 2, 174; Anderson 3, 155. In the juniors' event, McAndrew 1, 163 points; Barker 2, 144½; Stevenson 3, 125.

Seddon House were successful in winning the inter-House championship, and so hold the Cox Cup for one year.

Mr. Norman Kerr, the well-known Auckland physical culture expert officiated as judge. At the conclusion of the championships he congratulated the boys upon the excellent standard and clean finish of the work displayed.

COLLEGE BOXING CHAMPIONSHIPS, 1933.

The boys displayed their usual keen interest in this annual event. A total of 65 boys trained for a period of nine weeks in the gymnasium out of school hours, in preparation for the championships.

The following were successful in winning their respective championships: Heavy weight, any weight, R. Brown; light weight, 10 stone and under, Hutchings; feather weight, 9 stone and under, Burns; bantam weight, 8 stone 2lbs., Wallis; fly weight, 7 stone 10lbs., Aikman; paper weight, 7 stone and under, Abbott; midget weight, 6 stone 7lbs., Kinney; mosquito weight, 5 stone 10lbs, Chisholme.

Mr. Leeves, as the instructor and organiser of the tournament, wishes to thank the Auckland Boxing Association for their ready assistance in lending the College their ring, also for providing us with such experienced officials free of all cost.

Mr. Bush, the president of this body, when congratulating the competitors at the conclusion of the tournament, stated that he was very pleased with the standard of the boxing, also the sportsmanship displayed throughout both by the competitors and spectators.

On behalf of the Association he extended an invitation to all finalists to be present at the next Town Hall tournament.

Mr. Leeves, on behalf of the College, suitably responded.

GYMNASTIC NOTES.

During 1934 the College Gymnastic Display Class, under the instruction of Mr. Leeves, were called upon to give sixteen displays at various sports meetings, concerts, and gymkanas organised to raise funds for charity.

The class went as far afield as Dargaville, to support the District High School at their annual fete. In March of this year they supported the St. John Ambulance by giving a display at their fete at Carlaw Park. His Excellency, Lord Bledisloe, congratulated the boys upon their performance on this occasion. Three displays were given during July, two being at the Winter Exhibition, and one at the Ambassador's Theatre, Point Chevalier, the latter being in support of local school funds.

It is interesting to see past day students of the College, who have been members of the evening class for five years, still taking a prominent part in all these displays. This fact should prove an incentive to others to join the classes provided for their benefit. The standard of work displayed calls for several years of careful training, and naturally, the one to gain is the boy himself who builds up a good sound body and constitution, a life-long asset.

House Notes

BINNS HOUSE (GIRLS).

House Mistress, Miss Adams; Junior House Mistress, Miss Kissling; Captain, Althea Pallister; Committee, C. Willoughby, J. Macdonald, B. Brooke, M. Gow.

We are not as far up the ladder as we wish to be, but we still hope to reach the top sometime before the end of the year. At the Swimming Sports we made a splendid start. To the great disappointment of the House, our former aquatic star, Connie Watters, was absent; and the burden fell to Althea Pallister, who carried it triumphantly to bring us into first place. At the Athletic Sports, by dint of some good team work, we managed to gain a close second; but our Basketball points have begun disastrously. We have been more than usually unfortunate this year in having one after another of our best girls leaving.

Owing to Miss Allum's visit to England, we have welcomed as Junior House Mistress, Miss Kissling, to whom we wish happiness in her new surroundings.

A vacancy in the College Office at the beginning of the second term, deprived the House of its captain, Joan Stanley. It was felt that some token of our appreciation of all that she had done for us would be very acceptable, and so the House made her a presentation of a silver vase. Althea Pallister has taken her place and displays unbounded energy in fulfilling her many duties. We hope every House member will help her loyally.

BINNS HOUSE (BOYS).

Housemaster, Mr. L. M. McKillop; Assistant Housemaster, Mr. E. C. Wooller; House Captain, M. A. Wakefield.

Once again the boys of Binns House have upheld their reputation of being well up in the hunt for the premier House Shield. Last year we were narrowly defeated by Hindley, and again this year there is strenuous competition for every point. We are very hopeful of collecting that shield at the end of the year.

Binns House contains several members of outstanding ability, but unfortunately they are seldom competing in House games, as they have to practise for the College Saturday teams, therefore, the remainder of the boys have to rely on combination rather than individuality to gain points.

Following is a brief resume of our success in sports activities.

Athletics—

Always a strong point with us, we finished second to Seddon. The Senior Champion, breaking two records, and winner of Long Jump at Inter-Secondary Schools' Sports, was supplied by Binns House

Cricket—

Here we have an example of the calibre of Binns House boys. Five members being in the First XI. They are: Wakefield, Thompson, Burton, Castles, and Broberg. If we can win the third term cricket games the Shield will be ours. Here's hoping.

Rugby—

Here again we supply the College First Team with most of its members: Wakefield, Thompson, Nelson, Duncan, Taylor, Lord, Rawnsley. With these, and other Saturday players, absent, our teams have done well to win most of their matches in the House games.

Swimming—

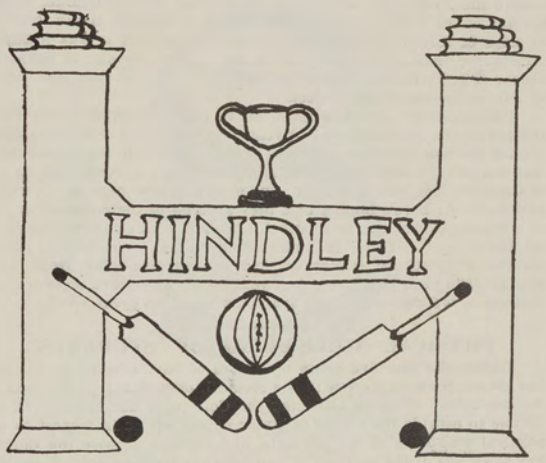
Swimming has been our weak link for several years, but this year, due to the efforts of Naughton (Junior Champion), and several handicap place-getters, we pulled up considerably.

RIFLE CLUB NOTES.

The Rifle Club is blossoming as cheerfully as ever. Every other Saturday, the enthusiastic gather at an early hour at Penrose, rub their somewhat sleepy eyes, and gaze on that rather elusive article, the Service target, which, large though it is to "mark" appears exceedingly small at 200 yards, or even 500 yards—which Messrs. Ch—d, R—we and Co. will be quite willing to point out to all and sundry for a very minor consideration. It appears that our friend, Ch—d, has at last found a rifle that fires neither too high nor too low—it now shook merely a little to the right or left. Also, it appears that if four certain people ate less for breakfast, they would tackle that "run down" in more athletic style; as it is, the run of 300 yards simply finishes them for the day.

This year's Earl Robert's Trophy team: Covey (captain), Chatfield, L. Tweedie, J. Clarke, L. Rowe, were unlucky in being beaten by Mt. Albert in the command shoot, the scores were 222 to 215—quite close. Both teams had shot better during preliminary practices. Mt. Albert now have the final shoot in which they compete against a large number of schools throughout the Empire. With constant practice on the part of our boys,we should be able to enter a good team next year. Some of the newer members are showing quite good promise at present and should improve a good deal by next year. Congratulations are due to Clarke, who won a Logan Campbell Medal for his performance in the Imperial Challenge Shoot in 1933, in which he put up an excellent performance.

Start of Egg and Spoon Race.
—By courtesy of "Auckland Star."



HINDLEY HOUSE (GIRLS).

Senior House Mistress, Miss Vickery; Junior House Mistress, Miss Aitchison; House Captains, Flora Te Papa and Rhona Tilby; Committee, Ruth Norrie, June Vear.

After several years of bad luck Hindley House is once again maintaining her previous good position on the playing field. Last year we managed to come first for the whole year, and this example seems to have encouraged us to even better efforts, and so far we have done exceedingly well.

At the beginning of the year we came second in the Swimming Sports, Pat Johnson winning the Senior Championship. It is true that second is not as good as first, but even if it is not, it is a great deal better than third or fourth, and besides, we cannot always gain the highest place. In March we obtained the first place in the Athletic Sports. This time we won both the Senior and Junior Championships, the Senior being won by Rhona Tilby, and the Junior by Vera Faulkner.

During the second term Hindley did very well in Basketball, and at present is heading the list. It has been a hard struggle to keep ahead of Wellesley House, and even now, we are leading by only a small margin. We hope to keep our lead till the end of the basketball season.

Up to the present time we have done better than last year, so we are living in hopes of coming first once more.

HINDLEY HOUSE (BOYS).

Last year Hindley gained the proud distinction of being "top House," having scored consistently throughout and having in addition won all the individual sections of the competition except the athletics. This pleasing result was due to all members of the House putting their shoulder to the wheel, and especially to the able leadership of a few of the leading spirits, particularly, George, Mason, Meiklejohn, Wallace, and Hitchings. Lloyd George, as House Captain, was called upon by Mr. Park at the breaking-up ceremony at the end of the year, to

receive the House Cup awarded to the winning House. George, during his stay at the College, had been a member of Hindley House, both in its days of fortune and its days of misfortune, and it was a happy coincidence that in his last year at the College he should have the honour of receiving the House Cup on behalf of his House; and, before he left, to become Head Prefect.

Unfortunately, 1934 has taken heavy toll of Hindley House boys, and few of the mainstays of last year now remain, so that the remaining and the new members are being urged to maintain the House spirit that has always been present in Hindley. It is a difficult task to try to maintain last year's position, but even the new boys are working hard to do it: here's hoping that they succeed in their endeavour. So far swimming, athletics and football have not been startlingly successful, but at least, Hindley is holding its own, and is confidently awaiting the steeplechase (which marked the turning-point from hard struggling to clear-cut victory last year), and the cricket, at which our Housemaster's enthusiasm always spurs us on to great efforts.

PHYSICAL WELL-BEING OF STUDENTS.

During the past five years the Board of Managers of the College has given special attention to the medical, dental and optical care of the day school students attending the College. It has been found advisable to provide the means of giving expert advice in respect to the physical well-being of the students, and for this purpose the College has made use of the services of two full-time physical culture instructors, one for boys and one for girls, as well as of professional men engaged in medical, dental and optical work in the city. Every day school student is medically examined during the year at least once by Dr. J. Fitzsimmons, who has given a great deal of his time in this good work. The physical instructors attend at the medical examination, and advise parents in respect to matters which require attention, while they also in special cases, carry out special courses of physical training with the object of removing or reducing physical defects. The vision of each boy and girl is tested, and those found below normal are given a special expert examination by the College optician so that parents may be informed whether defects of vision are becoming serious. Dental examination is also conducted, and expert advice and treatment are provided where these are necessary.

As a result of this work a physical history of each student is kept and subsequent examinations reveal the result of the treatment undertaken during the year. Parents are encouraged to keep in direct touch with Miss Boynton and Mr. Leeves who have charge of the physical work and help is provided in those cases where the need for it exists. The need for physical well-being, is, therefore, fully recognised and there is no doubt that the mental development of our students is not hindered in many cases from physical conditions. The College authorities desire to have the continued co-operation of parents in this work, and they have been greatly stimulated by the many expressions of thanks which have come from parents in the past in respect to this work. We hope that everyone concerned will realise that the years in which young people attend the day school of the Technical College are especially important years in their lives, and that no possible opportunity should be missed to ensure that the fullest possible development in physical, as well as mental and moral growth is achieved. Parents will find the physical culture instructors always glad to discuss any problems relating to the physical welfare of their children and willing to draw upon the expert advice which the Board of Managers has made possible.

SEDDON HOUSE (GIRLS).

Senior House Mistress, Miss Boynton; Junior House Mistress, Miss L. Anderson; House Captain, Connie Clayton; Committee, E. Bussey, J. Bussey, A. Catchpole, B. Ellis, D. Mansfield.

Although Seddon House has not been extremely successful during the past year, in some sport we performed really well. At the Athletic Sports, we were very high up, for we won the stilt race. That, at least, is two feet in the air. The most interesting feature of this year's activities is the House points. Sad to relate, ours are conspicuous by their absence. This, we feel is due to the House Mistresses (we must blame someone), as the girls have done their very best to maintain the name of the House.

We are very proud of "our Audrey" for was she not runner-up for the Junior Athletic Championship? We are confident that she will run a step further up the ladder next year and win. Our prowess in the Swimming Sports must be left to the imagination, while at tennis, if we told all our virtues, we might disgrace the other Houses (ahem!) It seems rather a pity, but our skill on the Basketball courts, leaves a lot to be desired.

But, Seddon House, buck up ! That Cup at the top of the page is to be ours next year.

SEDDON HOUSE (BOYS).

Housemaster, Mr. J. L. G. Carnachan; Assistant Housemaster, Mr. J. Brooke; House Captain, H. Borich.

This year Seddon House has had many successes. We were not so successful in the Swimming Sports as we might have been, but we were well pleased with the final result. Our strength lay in our Relay Teams, who came to light at a critical moment, to bring us from last to third position.

Cricket—

In this summer sport we have maintained our last year's position. First XI. players: Clark, Kent, Brady, Woolley, Abbott.

Athletic Sports—

Wednesday, March 28th, was Seddon's day. Our entrant in the Senior Championship was Tweedie, who succeeded in winning the Mile

Race. In the Intermediate our representatives were Stevenson, who came second, and Tweedie, who won the 880 yards race. We had a feast of wins in the Junior Championship, two of our boys, Clark and Herring, came first and second respectively. Clark led the way home in the half-mile event, closely followed by Herring and Manning, also of Seddon House. The time was a record. In the Long Jump, Junior Championship, we filled first, second and third places. Clarke was again first, Woolley second, and Manning third. In the Handicap Events, Harrison was outstanding, being first in the Long Jump under 15, and first in the 100 yards under 15 years. In the Cycling Events McInnarney and Chappell gained us points. The Tug-of-war Events were a triumph for Seddon, our teams filling first places in the Senior and Junior Event, and third in the Intermediate. Our Juniors and Intermediates were successful in the Relays and the Seniors came third.

Rugby: We have slightly improved our last year's position. First XV. players: Borich, Tweedie, Finlay.

Stevenson Cup—

Last year Mr. Stevenson kindly donated a handsome silver cup for competition among the boys of Seddon House, the cup to be presented to the boy gaining the greatest number of points for his House. Last year J. Meiklejohn, the Head Boy of the House, won. The value of the cup has been shown in the increased efforts of the boys to gain points for their House.

THE COLLEGE SECTION OF THE SAVINGS BANK.

The popularity of the college section of the Auckland Savings Bank and the increasing use which is made of it by the pupils, are shown by the returns below, which have kindly been supplied by the Auckland Savings Bank.

When compared with those of the previous year, the statistics of 1934 show a marked increase in the total deposits, those of 1933 amounting to £214. It is felt sure that the decrease in the number of operative accounts (number in 1933 was 137) is due to the transferring of pupils accounts to the Post Office Savings Bank. During the year 44 more depositors have passed through the college.

Any inconvenience or self-denial which may accompany a deposit is certainly recompensed by the satisfaction that one has not only what has been saved, but also the interest paid for the loan of it. This should be sufficient to induce any to save.

STATISTICS.

NO. OF OPERATIVE ACCOUNTS.

1st February, 1933	95
31st January, 1934	103
30th May, 1934	129

BALANCE AT CREDIT OF DEPOSITORS.

1st February, 1933	£329
31st January, 1934	£444
30th May, 1934	£461

AMOUNT OF DEPOSITS.

1st February, 1933 to 31st January, 1934 .... £350
(Includes £259 transferred from other schools.)

AMOUNT OF WITHDRAWALS.

1st February, 1933, to 31st January, 1934 .... £254
(Includes £51 transferred to Savings and Panny Banks Department).

No. of Depositors 1/2/33 to 31/1/34	703
No. of Withdrawals 1/2 /33 to 31/1/34	122
No. of New Accounts 1/2/33 to 31/1/34	72

(Includes 54 transferred from other schools.)

Total No. of Depositors who have passed through College to date	406

INTEREST ADDED TO ACCOUNTS.

1st February, 1933, to 31st January, 1934 £18/2/11

FIFTH GRADE A TEAM.

Back Row: Harris, Vaughan, Otter, Gibson, Smith, Ward, Williams
Middle Row: Mr. Drake, Bolton, Lund, Morrison (capt.), Anderson, Marsden, Gray.
Front Row: Poole, Patterson.
Insets: Archibald, Murphy, Annan.

—S. P. Andrew.

SIXTH GRADE A TEAM.

Joint Winners of Grade. Points For, 45; Against, 6.

Back Row: Mr. McKillop, De Maus, D. Jones, Jennings, Muller, Johnston, P. Jones, McClennan.
Middle Row: Brennan, Howard, Yates, Bundock (capt.), Selwyn, Montague, Nicholson.
Front Row: Owens, Riddell, Veart, McCook.

—S. P. Andrew.

WELLESLEY·HOUSE NOTES.

WELLESLEY HOUSE (GIRLS).

Senior Mistress, Miss F. E. Lee; Junior Mistress, Miss A. A. Stubbs; Senior Captain, Elsie Perrin; Junior Captain, Joan Baird.

Towards the end of last year a "Best Girl" contest was inaugurated for the House, the winner to be selected for all-round attainments, mental and physical. Further considerations were to be her character and general school influence. From the House funds were purchased a handsome Silver Cup, and also a miniature, both suitably inscribed. The award for 1933, decided upon after the "Seddonian" had gone to press, was made to Olive French, who possessed a fine record of achievements. Need we say that we are all striving this year to excel and to gain this coveted honour?

Without dwelling unduly on what our House did last year, we must mention that, after the publication of the "Seddonian," we were successful in having our name inscribed on the Cup presented by Seddon House for superiority at Basketball. It is too much to hope that to us will fall the honour over-frequently; but whatever may happen, we have the satisfaction of knowing that we occupy pride of place. The House of 1933 showed us the way—may we follow where they led!

Sad to relate we have little to record in the way of individual achievement. The sole exception seems to be the performance of our Junior Captain at the Swimming Sports, when she succeeded in winning the Junior Championship. If we cannot boast personal prowess and triumphs, however, we can say that the girls of Wellesley House endeavour to cultivate that team spirit which helps to atone in some measure for the lack of outstanding individual ability.

WELLESLEY HOUSE (BOYS).

With Mr. Wood and Mr. Stewart as Housemasters, and the large muster of stalwart youths which gathered in Room 16 on the first day, our hopes for a successful year rose. Owing to the lack of seniors in the House, the juniors and the few seniors have striven loyally to uphold the honour of the House.

At the Swimming Sports Meeting we were successful and won most points, mainly owing to the efforts of Pascoe, the young champion, who won the Senior Championship,, O'Dowd and the juniors.

We were not so successful at the Athletic Sports when we were just beaten for second place by a few points. Those of the House who distinguished themselves were O'Dowd who was just beaten in the mile, Galloway, Wilshere and Turnbull.

On the football field we scored moderately well, and here also we had five of the College's First XV., namely Galloway, Turnbull, Pickering, Fry and Burgoyne.

We are hoping to score well in cricket in the third term, and in the steeplechase. Still, if we are not successful, we will "Try, try, try again," and be first to congratulate the winners of the coveted shield.

THE COLLEGE LIBRARY.

The opening of the College Library in the second term of 1934 marks an important step in the history of the school. For several years, a collection of books has been available, and under the supervision, during recent years, of Misses Davis and Henderson, these have been made available to the day students. In addition to the main collection, the various departments of the College have been building up valuable collections of technical books related to the work of their departments. The need for adequate accommodation for all the books has long been realised, but it was not until recent additions to the workshop block had been completed that space became available. Careful thought was given to planning the most suitable position, and a committee of staff members was appointed to plan the furnishings of the new Library. Rooms 19 and 21 were merged and suitably decorated, steel shelving (made in New Zealand) fitted and improvements carried out to provide an attractive home for the new Reference and Lending Library.

The City Librarian, Mr. John Barr, was good enough to assist with advice and offered to place facilities at the disposal of the Library Committee. This offer has been made use of freely, and warm thanks are due to Mr. Barr and his assistants who have generously given advice and assistance in such matters as indexing, filing, classification and records, with the result that the Library is being started off with the best systems available. Parties of senior students have visited the Public Library, and after hearing an interesting talk on the Library and its uses, they have been escorted over the Library and given the opportunity to discover for themselves how to locate on the shelves any book in which they may be interested.

Towards the end of the second term, Miss Irving, now a student teacher at the College, was appointed Librarian, and the big task of classifying the books was commenced, under the supervision of Miss Davis, Chairman of the Library Committee, and with the assistance of the staff of the Public Library. The sectional libraries were transferred, and in a few weeks the Library was opened for reference purposes by both day and evening students. A short time later, books were made available for loan by the students, a privilege which it is hoped soon to extend to the evening students.

In the Library, there are in the vicinity of 4000 books, some 900 being fiction and the remainder are classified under such headings as travel, geography, history, biography, literature, sports, poetry, and the numerous arts, crafts and sciences associated with the work of the day and evening classes. The Library Committee has been provided with a moderate annual income to meet the cost of routine expenses and to provide for additions to the Library. In connection with the work of our day and evening students, the provision of up-to-date works of reference must prove of immense value, and should go far towards placing the College among the leading educational institutions of the Dominion.

ACKNOWLEDGMENT.

The profuse illustration of the "Seddonian" is largely due to the generosity of the "Auckland Star," who have placed at our disposal numerous photographic blocks relating to topics of interest to the College.

PRE-WAR STUDENTS' MEETING.

On the first Saturday afternoon in July of each year, a function which the present students know or hear little about, takes place at the College. Although it is probably one of the most informal gatherings held during the College year, an unalterable rule governs the attendance. Only those who attended day classes at the College prior to the War (August, 1914), are eligible for attendance at the Reunion of the Pre-War Technical College Day Students.

The one held this year was considered by everybody present to be the most successful function of its kind to date.

During the early part of the afternoon a steady stream of old pupils flowed into the College.

The President, Mr. R. S. Lediard, was brief, to the point, but sincere, with his opening remarks welcoming the old students back to the College.

Mr. Burley conducted an interested party over the College workshops and laboratories. The visitors were amazed at the progress which had been made since their day, and found it difficult to realise that this was all part of the old school with which they had once been so familiar.

Community singing led by Miss Ida Walker, and songs by Mr. S. Duncan, accompanied by Mrs. England—all old pupils—provided a pleasant interlude.

Afternoon tea-time was particularly enjoyed. Everyone warmed up and tried to speak at once.

Reminiscences flowed like water; masters and mistresses came in for good-natured banter; and deep down, everyone felt that to be present was a pleasurable privilege.

Anybody observing the gathering could see that it was quite evident that even in its infancy the College implanted upon its students certain characteristics and traditions which, and it is gratifying to record this, despite the vicissitudes of the last twenty years, have remained so strong that it is still possible to issue a call and find the old students rallying round as in their school days.

MAGAZINE HELPERS.

The following boys of Accountancy 2B have rendered valuable help to the Editor of the "Seddonian" during the compilation of the College magazine.

J. PILKINGTON,
G. TANSLEY,
D. THOMPSON.

They are here thanked for their willingness to carry out any task allotted to them.

The Editor wishes to thank Com. 1B for their help during a certain revision period during the Second Term Exam. We understand that the girls never worked so hard before as they did that morning copying out contributions to the Literary Section of the Magazine.

EXCHANGE MAGAZINES.

In the School Library will be found a good selection of magazines received from other schools—not only in New Zealand but also overseas.

THE CULT OF THE PEANUT.

O peanut, little peanut,
  Food of the chimpanzee,
    Shall man's descent
    From apes prevent
  Your being food for me?
The smallest parcels, if aright
  The maxim I recall,
When opened give the most delight—
  And you are VERY small.

Upon his bended knee, nut,
Behold thy devotee, nut.
At breakfast, lunch and tea, nut,
  I worship in this way.
No other nut could be, nut,
Equivalent to thee, nut;
Incalculable peanut!
  Be with me as I pray.

Thy substance, vulgar peanut,
  The proletariat chew.
    What do I care?
    I know that there
  Are vitamins in you.
Then let us seek the picture show
  And mingle with the crowd,
Shelling a peanut as we go
  And let who will be proud.

I well can guarantee, nut,
There is no Pharisee, nut,
Of high or low degree, nut,
  Who has not heard thy call.
Two Voices there may be, nut,
And one is of the sea, nut,
The other—thine, O peanut,
  The loudest Voice of all.

Come to my jaws, my peanut,
  With or without thy shell,
    Salted or not,
    Or cold or hot—
  I'll love thee just as well.
O what can ail thee, little nut,
  That thou despised must be?
Britannia needs no bulwarks, but
  England hath need of THEE.

I hope that you will see, nut,
My message and agree, nut,
This is my only plea, nut,
  When I at length depart
Think only this of me, nut,
That they will find a peanut,
A little roasted peanut
  Encloistered in my heart.

—R. G. Park.

IOLANTHE

"A Definite Success."

The Annual School Entertainment in the form of the Gilbert and Sullivan Opera "Iolanthe" was presented for a season of four nights, the last being a charity performance in aid of the Crippled Chidren's Fund sponsored by the Rotary Club.

"With gay frocking and happily arranged stage movements, "says the Auckland "Star" (26/10/34), "the carefree spirit of the play was recaptured in a convincing style. Particularly creditable was the singing of the various numbers by the large cast of principals. It is always difficult to imagine songs of fantasy given their true value by immature voices, but players and producer alike must be congratulated for their appreciation of this point and their keenness to make the singing convincing. Dainty costumes for the fairies, pleasantly resplendent robes for the peers, and suitably gay attire for the Phyllis, Strephon and the Lord Chancellor provide just the right note of happy entertainment. Somewhat unexpectedly, be it admitted, the underlying vein of gentle satire, peculiar to G. and S., is given due emphasis. Lighting effects were at times spectacularly done. Scenery, costuming and stage properties were all produced by various sections of school instruction classes; the dresses in particular reflected great credit on the pupils. Gilbert and Sullivan is never easy to produce, and "Iolanthe" last night was a definite success. More need not be said of it."

Competent critics have expressed their admiration of the high standard of work shown by the juvenile performers. Mr A. B. Thompson, the organiser and producer, is to be warmly congratulated on the results which months of painstaking preparation on the part of of himself and the cast have brought forth. No praise can be too high for the singing of the chorus which was an outstanding feature of the show.

Cast:

The Lord Chancellor, Martyn Bell-Booth; Earl of Mountarrarat, Arthur D. Carlaw; Earl Tolloller, Raymond S. Brown; Private Willis (of the Grenadier Guards), Claude Pickering; Strephon (an Arcadian Shepherd), John S. Nicholson; Queen of the Fairies, Betty Brooke; Iolanthe (a Fairy, Strephon's Mother), Edna Lewis; Fleta, Celia, Leila (Fairies), Lorna Mills, Veda Lockwood, Sadie Hewson; Phyllis (an Arcadian Shepherdess and Ward in Chancery), Nancy Power; Chorus of Dukes, Marquises, Earls, Viscounts, Barons, and Fairies. Understudies (whose valuable work deserves acknowledgment): Strephon and Lord Mountarrarat, Kenneth Massicks; Lord Tolloller, Ernest Sutherland; Private Willis, Clarence Tibbitts; Iolanthe, Joan Vanderberg; Queen of the Fairies, Roma Farmer.

CROSS-COUNTRY RUN.

The Annual Run took place on Tuesday, October 30th, over the Domain course, which was first used last year. The weather was overcast with light showers at intervals, which was, of course, better for the competitors than a very sunny day.

Shortly after two the Juniors started on their long journey, followed later by the Intermediates, and then the Seniors.

RESULTS.

SENIORS.

1st.—H. Taylor, Ag. 1 (Binns.

2nd.—A. Vaughan, Acc. 3 (Binns)

3rd.—C. Thorpe, E.3A (Hindley).

Fastest Time: H. Taylor, Ag. 1 (Binns), 20 minutes 23 seconds.

INTERMEDIATES.

1st.—H. Oxley, T. 2 (Seddon).

2nd.—D. Gray, A.1B (Wellesley).

3rd.—E. Cathcart, M.E.1 (Binns)

Fastest Time: D. Gray, A.1B (Wellesley), Williams, E.3A (Wellesley), 21 minutes 19 seconds.

JUNIORS.

1st.—Nicholson, E.1C (Seddon).

2nd.—Tucker, M.E.1 (Binns).

3rd.—Marsh, Ag. 1 (Binns).

Fastest Time: Davies, M.E.1 (Binns), 22 minutes 19 seconds.

HOUSE POINTS.

Binns performed much better than they did last year, and were easily first, thanks to their showing in the Senior and Junior sections.

House.	Senior.	Intermediate.	Junior.	Total.
Binns	82	59	81	222
Hindley	55	52	74	181
Seddon	64	43	67	174
Wellesley ..	39	86	18	143

CONGRATULATIONS.

Congratulations are due to Miss Lyndall Burley, B.A., L.A.B., the pianoforte instructress at the College, upon completing work in pianoforte music, theory, and practice which gained for her the coveted Licentiateship of the Associated Boards, London. In addition, Miss Burley completed the degree of Bachelor of Arts of the University of New Zealand.

Miss Burley has had a very successful career as a pianist. In the Licentiate Examination she gained highest marks in the Auckland Province, while, previous to this, she secured the Silver Medal for second place in the Dominion.

During the two years that Miss Burley has been instructress in pianoforte at the College, she has given valuable assistance as pianist for both, "The Pirates of Penzance," given in 1933, and "Iolanthe" this year.

Technical High School Courses

The "Seddonian" is very widely read, this issue going to more than 1000 homes. Among our readers are past and future students, and it has been thought that some outline of the nature and objects of the courses of instruction now given at the College, will be of interest.

The Technical High School has in the past four years enrolled about 1,200 pupils who have completed their primary school education. It is staffed by a full-time staff of 47 highly qualified specialist teachers and controlled by a Principal and four Heads of Departments. Included in the staff are a male and a female physical culture specialist, each devoting full time to health work in which they are assisted by Dr. J. Fitzsimmons, an Auckland practitioner, Mr. W. A. Taafe, a leading optician, and five of the city's practising dentists. The staff experts carry on a continuous search for physical defects, in addition to regular physical development classes. Gymnasium work has reached a high standard, and in addition, the health of pupils is assisted by a system of organised games—football, cricket, tennis, basketball or swimming, on Tuesday afternoons. The School is divided into four Houses (Binns, Hindley, Seddon and Wellesley), and continuous competition through the year enlists a spirit of healthy rivalry in these games. Further, there are not less than 20 teams engaged under staff supervision in Saturday inter-school games. There is little that has been left undone on the physical side of our work, but we have still in prospect an important project in the development of a health camp on an inland site, where special work among those who are underdeveloped may be carried on by the physical instructors in holiday periods. Donations toward this objective will be gratefully received.

Competing with physical work in importance, is the development of character. Pupils are received from the primary schools at a most important age. New Zealand is in this respect out of line with most other countries, and it is generally agreed that the transfer should take place at 11-12 years of age. It is almost essential that pupils should be under the same control during the years 12-16. There will be proper time, then, for careful and continuous control of the developing character. The Technical School has a wonderful asset in the natural interest which our type of work has for the pupils. Each pupil selects his course of work to suit his future vocation, and the pupil can easily place lessons in their proper relation to life's work. If there is not a real interest in the school work, there is something unusual in the boy or girl. This interest is strengthened by the provision of much apparatus, and many parents are not aware of what the Seddon Memorial Technical College has done in this regard. It may be of interest, therefore, to state that in the years 1927-1932 only, the equipment purchased for use in our classes has cost over £7,000. We are particularly fortunate in this respect, for our College claims now to be the best equipped school in New Zealand. In our work we are, therefore, able largely to remove corporal punishment for we rarely need a spur of this kind. In consequence, honesty and straight-

forwardness has been put as a first objective, in the character training which is a main purpose of secondary work.

The present staff is a young one, particularly keen and unusually well qualified. Each member is responsible for the supervision of the character work of one Form, and it is therefore rare that pupils with a wrong moral viewpoint remain long in the College. The School is provided (thanks to the bequests of the late Mr. Binns and the late Mr. Hindley) with one of the best school Assembly Halls in New Zealand. It is equipped with everything necessary for adequate training in musical and dramatic work. The staff includes experts in art, needlework, electrical engineering, woodwork, radio engineering, music and dancing. Our school concerts aim, therefore, at productions that for schools are considered ambitious. This year we have produced with considerable success, "Iolanthe," and the large number of pupils required for this have received training that must leave a valuable impression with them.

In another way also, the development of character is promoted in a technical college. The many and varied courses of instruction make it possible for many types of ability to be discovered, and thus we hope to prevent the sad position of young people taking up occupations for which their natural abilities do not suit them. Among educational experts no factor has been given greater attention in the past 20 years. Just as Nature has given the people of the world a multitude of diversified talents, so it is essential that the old type of post primary school should give way to a new type of school providing varied courses to suit different types of ability. This process is going on in most of the more progressive countries: to force all young people into the same mould and turn them out into the world is now accepted as wrong. Secondary schools throughout the world are attempting to provide courses of more varied nature. Our College is fortunate in that twenty years ago it put this principle into its courses. The intervening years have been spent (1) in acquiring and training the necessary specialist teachers, (2) in drawing from overseas and experimenting with new methods of teaching, and (3) in accumulating the absolutely essential equipment. Almost every educational commission of recent years in New Zealand and in the United Kingdom, has praised the kind of course provided in our technical schools. And it will surely be conceded that the development of sound methods of teaching in new types of work, the gathering of specialist staffs and the accumulation of the necessary apparatus can only be done over a fairly long period. That our work is commended locally is evident from our day school enrolments, given below as on 1st March in each year:

1922	598	1929	1,077
1923	748	1930	1,123
1924	772	1931	1,238
1925	768	1932	1,173
1926	800	1933	1,232
1927	918	1934	1,328
1928	993		

In selecting the post primary school to be attended by their children, parents are frequently actuated by considerations of little educational value. Consequently we consider it of some importance to refer to the principles underlying the instruction provided for the day school pupils.

There are many even among educational experts who do not clearly understand the values which attach to technical work; some are under an entirely wrong impression that in the technical schools attention is given wholly to the training of young people in handwork.

It may, therefore, be advisable to explain that there are very important reasons for taking a course at a technical college if a pupil intends to follow a life for which our school claims to prepare.

(1) In the first place it will be readily agreed that all school work has as its chief value the training of the power to think. Most school subjects are soon forgotten after leaving school, but they have, nevertheless, served their purpose in strengthening the intellectual powers which Nature has given to us, and life will require us to use. It may be surprising to claim that handwork develops intellectual powers. But there are powers of the mind which can only be developed through work of the kind done in technical schools, and it is these very powers that are essential to success in work in the vocations for which the technical school prepares. In music a child should commence, as early as possible, but in handwork subjects some argue that work should be postponed until after the secondary school stage has been passed. Technical school people know that their work must be given as early as possible if the mental powers to which we direct our attention are to be strengthened to the maximum amount possible. It would not be possible to explain briefly the directions in which the boy trained in technical colleges has superior mental capacity for his kind of work over the boy trained in other types of secondary school, but it will be obvious that general work mostly from books cannot develop the power to visualise which is essential in constructive work. We are always glad to have parents visit the College and ask to be shown proofs of our claim.

(2) In the second place, handwork skill in itself is a valuable possession whatever the occupation. In the engineering world accuracy to 1-1,000 part of an inch is required, and before long, 1-10,000 of an inch will be demanded. If an engineer is to be capable of developing accuracy of this extremely fine character, it need hardly be explained that long experience and very careful training are necessary in the instructor. Technical schools claim that unless the boy commences before his muscular development has gone far, he will never attain the standard of accuracy required of the efficient engineer. We have seen in our Colleges many students who have commenced too late in life and so fail to reach a standard of accuracy which is easily attained when the boy commences early. Parents whose children delay this work, therefore, are almost certain of failure unless factors outside of the school are sufficient to give the necessary training.

(3) There is another important asset of technical school work in that children are naturally interested in the subjects that are taken. In almost every course a substantial portion of the work is directly connected with occupation. Most of the equipment has been provided for the purpose of making these classes closely resemble the work of the world. It will, therefore, be understood that the interest of pupils is readily caught, and it should be remembered that no force is more powerful in education than interest.

COURSES OF INSTRUCTION.

Some particulars of the courses of instruction and of the prospects available to the student, are listed below.

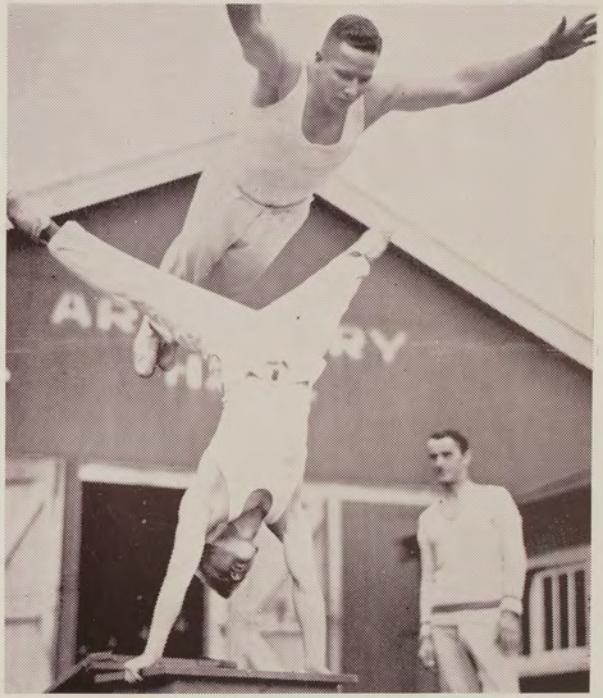
(1) **Agriculture Course.**—In this course the students' time is divided between general school work subjects—English, Arithmetic, History; Sciences which are essential in Agriculture—Botany, Chemistry, Zoology, Agriculture and Dairy Science; Handwork subjects, Woodwork, Metalwork and Farm Mechanics, and practical work in the garden and nursery or on the farm. The Board of Managers has an intensive area of four acres, situated in Benson Road, Remuera, where boys are given instruction under practical men in the practical

work of the garden, the nursery, the poultry farm or the orchard. This work is mostly for first year students, and girls are taken as well as boys. In the second and third year the pupils receive instruction on the farms of Messrs. Jones and Miller at Glen Eden. "Glendene" known as the "Model Farm," the property of Mr. Jones, is 64 acres in extent, and has a high producing Jersey herd, a pig farm and a poultry farm. Mr. Miller's farm is mainly a pig farm; on it are grown carrots, mangolds, sugar beet, maize, turnips, etc., for the food supply. Boys visit these farms periodically in order to have practical experience in connection with the cultivation and the growing of root crops, the management and feeding of stock, and the business organisation of the farm. The boys of the second and third year classes in Agriculture, therefore, have the advantages of practical work on farms of 64 and 100 acres, well-stocked and equipped and successfully conducted by thoroughly experienced farmers.

(2) **Accountancy Course.**—This course prepares boys or girls for office positions, or for the Accountancy Profession. It is a course in which the University Entrance Examination is the ultimate objective. In addition to the subjects required for this examination, pupils receive instruction in Shorthand, Typewriting, Book-keeping. The Technical College course differs from that of the Grammar Schools in that Shorthand and Typewriting are taught to Technical College pupils, while this is not usually the case in the Grammar Schools. Those preparing for business positions should understand clearly that the first examination for the accountancy profession is the University Entrance Examination of the New Zealand University. The Technical College conducts in its day and evening classes all of the work required for professional accountancy, so that if the work be commenced in the day classes it may be carried through to its completion either in the more advanced day classes or in the evening classes. Large numbers of ex-pupils of the Grammar Schools attend our evening accountancy classes, taken mostly by the day schooi instructors.

(3) **The Commercial Course,** is the usual course preparing girls or boys for entry to business positions. The chief object aimed at is the development of accuracy. Lessons in Shorthand, Typewriting, and Book-keeping are given every day, and a full supply of equipment of latest type is provided. At the same time general work in English, History, Arithmetic, etc., and in Dressmaking (for girls) is felt to be necessary. A two years' course will take a pupil of good ability to the stage of the Public Service Commissioner's Shorthand-Typistes' Junior Examination and Stage I. Book-keeping Examination of the New Zealand Society of Accountants. The general work of the class is sufficient to make it possible for them to enter for the Intermediate Examination. For senior pupils who have passed the University Entrance Examination at a secondary school there is a Diploma Course, similar to those of the business colleges, but differing from them in that free places are available.

(3a) **Commercial Art Course.**—This course is intended to provide for artistic girls who take up office work. It is thought that in the future there will be considerable demand for shorthand typistes who also possess some of the qualifications of commercial artists. In many offices duplicating work of a nature which will make it a serious competitor with the printing firms is now being done. This work requires artistic gifts, and where children are possessed of such gifts the Commercial Art Course will give them a training likely to fit them for the positions described.



A Difficult Gymnastic Feat.
—By courtesy of "Auckland Star."

(4) **Domestic Science Course.**—To this course are attracted girls who intend to enter some occupation connected with women's work. All of the needlework trades, artistic occupations, cafeteria or similar work are provided for. The girl is given a sound practical and theoretical training which will thoroughly equip her for entrance to any industry taken up by women. Artistic work is aimed at and in consequence, considerable time is given to training in good taste. Three specialist art teachers are available—one from the Royal College of Art, London, one from the Grey School of Art, Aberdeen, and from the Christchurch School of Art. In addition to the art work, Needlework and Dressmaking are given full attention, and for this purpose there is a staff of four needlework instructresses. The cookery work of the College is on thoroughly practical lines, the main task being to supply a cafeteria at which pupils and staff may purchase their meals. Practice in large scale cookery is aimed at, and in the advanced stages of the work, pupils receive training which will make the conduct of tea rooms, cafeterias or similar work one of little difficulty. The Domestic Science Course has been attended by a large number of girls, and the usefulness of the training for women's work is illustrated by the rapidly increasing roll numbers.

(5) **Engineering Course.**—In this course the object is to provide the future engineer with training in the theory underlying engineering activities. This is reinforced by the opportunity of applying these principles to a wide range of projects in a splendidly equipped Drawing Office, Science Rooms and Workshops. The aim in all practical work is to treat the student as an individual, educational experience recognising that each boy is a separate entity to be developed to the fullest extent. The apprentice who has received a sound training in the basic law of science, is able to make workshop calculations to a reasonable degree of accuracy, and has the skill necessary to make a working sketch of a machine, possesses qualifications which are of direct value in engineering. If in addition, he can handle a productive machine from the day he enters the industrial world, the boy is much more valuable to the employer, who in these days has to consider such matters. To provide a satisfactory school training, a modern and well equipped workshop is essential. It is useless to attempt to train pupils on obsolete or out-of-date equipment. All the machines and tools in the College workshop are of recent design, and practically every one has been installed in the past five or six years. Machines which have out-lived their usefulness are disposed of as a necessary policy. The work which is produced under these conditions, has the strong approval of those engineering firms, who are fully acquainted with it. In this connection, the high standard maintained may be gauged by the quality of the exhibits entered each year for the Seddon Medals, which are awarded only to work of outstanding quality. No award is made unless the examiners (who are representative engineers of standing in the city), are satisfied that every requirement of excellence has been fulfilled. These medals have been awarded in this Department every year since 1928, the year in which the system was inaugurated.

Thus on the applied side, there is the definite objective set before the student, that he can prove his ability as a craftsman. To those ambitious of obtaining further qualifications, there is offered the studentship examination of the Institute of Mechanical Engineers, London. This examination is held in Auckland, and comprises the subjects, General Knowledge, Mathematics, Mechanics and Physics. Qualification in this examination represents the boy's first step in gaining professional qualification for his life's work. Further progress may be made in Evening classes leading to the Associate Membership

Examination of the same Institution, and these are thought by many to be as good a qualification for New Zealand industries as a University degree. In addition to Machine Design, Strength of Materials, Electro-Technics or Metallurgy, a foreign language, such as French, Spanish or German, is necessary, and completion confers a Diploma which has world-wide recognition.

(5a) Motor Engineering.—This course is very similar to the Engineering Course, and what has been said previously applies equally to this course. There are some differences in the subjects, so that boys may qualify as motor mechanics by later taking the Department's Technological Examinations.

(6) Printing Trades Course.—The printing trades course is a course in which general secondary subjects are combined with trades instruction in order to equip boys for entry to the printing trades. The subjects in which general instruction are given (English, Mathematics, History, Geography, Economics), are those which eventually must be taken by candidates for the Diploma in Journalism. In addition, Shorthand and Typewriting are given as these are essential to the reporter. Instruction in Freehand Drawing, Lino-cutting, and the principles and practice of Typography will prove at a later stage invaluable to the boy who enters any branch of the printing trade as a mechanic. The Technical College course is, therefore, so arranged that a pupil may enter printing works as an apprentice to the printing trade, but in addition he will have the foundations laid in these subjects which will enable him later to change over if opportunity offers, to the journalistic branch of the trade. A Diploma in Journalism is granted by the New Zealand University, and as it is not necessary to pass the University Entrance Examination for this Diploma, a student belonging to the Printing Trades classes may reasonably expect to qualify for the examination at a later stage.

(7) Woodwork Course.—The woodwork course of the College provides for those students whose future is to be in one of the woodworking trades or in the sheetmetalwork trade. The general subjects are English, Practical Mathematics, Mechanics, Applied Geometry and Freehand Drawing. A really sound foundation in these subjects is essential if the future woodworker is to know the theoretical principles upon which all of the advanced work in his trade is based. In addition, in the well-equipped workshops of the College, under the experienced craftsmen teachers employed, the boy is able to develop that handwork skill and artistic taste which are so essential to the skilled craftsman. In view of the fact that many woodwork jobs are being replaced by sheetmetalwork, it is thought expedient to give the woodwork boys training also in the principles of Applied Geometry, Mathematics and Setting Out, which are essential to these trades.

OUR DISTRICT.

The Seddon Memorial Technical College considers its district to be that served between Papakura and Helensville. It is an institution possessing facilities which cannot possibly be extended to many portions of the country, and it is felt that its facilities should be opened to all who desire to attend the College. It should, therefore, be understood that pupils from anywhere may attend the College if there is sufficient accommodation available for them.

Free railway travel, however, is another matter and the Education Department's ruling is that pupils must travel to the nearest school at which they may obtain a satisfactory course in the subjects they desire. Pupils on the North line may, therefore, travel to the Helensville District High School or the Mount Albert Grammar School, on free railway passes if the courses desired are available at these schools.

Similarly on the South line pupils may be compelled to travel to Pukekohe Technical School or the Otahuhu Technical School if the courses desired are available at those institutions.

The cost of railway tickets for school pupils, however, amounts to 15/- per term, or 45/- for forty weeks, and the Seddon Memorial Technical College is prepared to spread the payments required for these over the year so that the cost will not really debar parents from sending their children to the College if they should desire to do so. By paying a deposit of 10/- and a weekly payment of 1/3, parents who desire to send their children to the Seddon Memorial Technical College, and who will be required to pay for their railway tickets, may be enabled to do so without any more inconvenience than the city pupils who travel to the College by tram.

CITY AND GUILDS INSTITUTE, LONDON.

The Metalwork classes take the Examinations of the City and Guilds' Institute in Electrical Engineering as the culminating point in their science course. The reason being that, in these times the use of electricity and electrical processes enters largely into the work of every engineer, whether he is a mechanical engineer a civil engineer, a motor engineer, or an electrical engineer proper. The boys in their third year, really two years and one term after starting at the College, are able to sit for the Grade I. Continuous Current Examination, following this up in either day or evening school with the higher grades in both Direct and Alternating current. During the present year the wisdom of this course has been demonstrated on many occasions, where several boys have been applying for a position. The employer's choice has invariably been the boy who has passed this examination. We are of the opinion that whatever branch of engineering a boy takes up, a sound course in electrical work makes him a better engineer of that branch than he would be if he had specialised in some other branch of science.

In the 1934 Examinations the following candidates were successful:

Grade I.

D.C.		A.C.
Aikman	McLeod	Tweedie
Allen	Morris	Newbery
Archer	Osborne	
Hitchings	Rhodes	Brown
Granwall	Talbot	Duffin
Humphreys	Parsons	Grant
McKenna	Tibbetts	Newbery

Day School: 100 per cent. passes.

Grade II.

D.C.	A.C.
Bland	Clark
Moir	Shearer
Milne	

Total Passes: 60 per cent.

In the year 1843 there were eight manufactories in London and others in different parts of the country, for regenerating exhausted tea leaves, persons being employed to buy these at hotels and coffee houses at 2½d and 3d per lb. They were mixed with a solution of gum and re-dried, after which the dried leaves, if for black tea, were treated with rose pink and black lead, to face them, and used to adulterate genuine tea.

CLASS LISTS
(As at beginning of Second Term.)

DIPLOMA CLASSES.

ACCOUNTANCY.
MR. H. A. JONES.

Secretarial Practice.

Bray, Vera
Gordon-Stuart, Elsie
Morton, Margaretta
O'Donnell, Dorothea

Accountancy Professional.

McCormick, J. D.
Piggin, S. F.
Wakefield, M. A.

Typography.

Edgar, S. L.

ENGINEERING.
MR. S. E. CLOSS.

Moral, B.
Pickering, C.

DRESSMAKING.
MISS STUBBS.

Feil, Wynne
Norrie, Ruth

COMMERCIAL COURSE—

COMMERCIAL 3A.
MISS HENDERSON.

Alexander, Enid
Bussey, Ethel
Clayton, Connie
Cosslett, Adeline
Davis, Marion
Fahey, Joyce
Gladwell, Peggy
Goddard, Kathleen
Goulton, Frances
Hill, Roie
Holder, Ethel
Judge, Betty
Korn, Phyllis
Ludgate, Olive
Mann, Neta
McGarry, Joy
Pallister, Althea
Perrin, Elsie
Roach, Eileen
Stacey, Sybil
Steer, Joyce
Vear, June
Wynyard, Heather
Cautley, Cecil

COMMERCIAL 3B.
MISS M. G. ANDERSON.

Brooke, Betty
Brown, Pearl
Catchpole, Audrey
Clarke, Lois
Clarkson, June
Cooper, Olive
Cressy, Joyce
Duffin, Gladys
Ellis, Beulah
Fletcher, Enid
Frith, Lorna
Franks, Joy
Garnham, Agnes
Govan, Lillian
Halford, Marjorie
Hogwood, Eileen
Kelby, Francis
Lynch, June
Morgan, Gwen
Morrison, Elsie
Mullins, Mollie
Nicholson, Joyce
Peake, Mary
Prior, Marjorie
Rogers, Rona
Savage, Joan
Shaw, Norma
Steel, Jean
Watson, Betty

COMMERCIAL 2A.
MISS DAVIS.

Ashby, Gwenda
Bellue, Ruth
Butler, Marjorie
Colclough, Marjorie
Collins, Beryl
Dawns, Marcia
Irvine, Anna
Jessop, Mary
Johns, Lamarna
Johnson, Lorna
Lindrum, Muriel
Mansfield, Dorothy
Melbourne, Nancy
MacDonald, Jessie
MacDonald, Nara
McLean, Eileen
McQuillan, Sybil
Norris, Ora
Pullan, Evelyn
Pilkington, Jean
Reeves, Jean
Rogers, Joyce
Sefton, Sylvia
Shaw, Jean
Smith, Dorothy
Stanford, Doreen
Sutherland, Beryl
Talbot, Joan
Voice, Winnie
Willoughby, Connie
Wainwright, Joan
Wedgewood, Nancy
Wilson, Rona
Wolfe, Rosie
Yates, Patty
Wilson, Margaret
Wilson, Nancy

COMMERCIAL 2B.
MISS L. ANDERSON.

Benson, Dorothy
Beswick, Lyle
Black, Eunice
Brewer, Amy
Buchanan, Mary
Clegg, Gretha
Corbett, Rita
Cowan, Dorothy
Crookbain, Enid
Dunn, Clarice
Dunn, Muriel
Gammon, Eileen
Gavan, Joyce
Glynn, Peggy
Griffiths, Gwen
Hanna, Eileen
Hastie, Joyce
Henderson, Minna
Hendriksen, Lois
Hill, Joan
Jansen, Cecilie
Johnson, Barbara
Johnson, Gwen
McLachlan, Joan
Miller, Rae
Moore, Nancy
Morris, Irene
Murray, Peggy
Naylor, Shirley
Parkes, Betty
Parnell, Daphne
Peake, Madge
Power, Nancy
Probert, Margaret
Rae, Myra
Richards, Kathleen
Smith, Dorothy
Stevenson, Marion
Thorrington, Thelma
Warner, Dorothy
Watters, Connie
Williams, Aileen

COMMERCIAL 2C.
MISS L. ANDERSON.

Ash, Gwen
Baker, Gwen
Baker, Joyce
Benjamin, Joyce
Bright, Rosa
Carter, Jean
Condon, Joan
Croft, Dulce
Davison, Marjorie
Demchy, Olive
Dent, Lorna
Dunstan, Eunice
Fatchen, Keitha
Finey, Dorothy
Griffiths, Marjorie
Havard, Kathleen
Hill, June
Howell, Lolo
Hoy, Yvonne
Humphreys, Myrtle
Land, Rona
Lewis, Edna
Lindsay, Velma
Lloyd, Dorothy
Martin, Clare
Miller, Aileen
Moncur, June
McKay, Reenie
Oakes, Thelma
Potter, Sybil
Quick, Heather
Scott, Nancy
Tyler, Bernie
Tyler, June

COMMERCIAL 1 Art.
MISS AITCHESON.

Kinslie, Dorothy
Barnes, Phyllis
Blakey, Beverley
Candy, Catherine
Catchpole, Doreen
Christiansen, Maisie
Christiansen, Sylvia
Donald, Dorothy
Evans, Eileen
Findlay, Beryl
Harnett, Joan
Hegh, Audrey
Henderson, Jean
Henderson, Joan
Hogwood, Rona
Huse, Mable
Ingham, Betty
Jamieson, Pauline
Lewis, Rene
Lockley, Jeanne
Lord, June
Maconaghie, Louisa
McLaughlin, Patricia
Morris, Eileen
Neville, Doreen
Noble, Eva
Oliver, Pearl
Porter, Nada
Prescott, Jean
Roach, Lillian
Robinson, Betty
Sinclair, Betty
Steadman, Jean
Stonex, Kathleen
Taylor, Verna
Thomson, Evelyn
Tyler, Lorraine
Wardle, Doris
Webber, Nancy
White, Winnie
Wood, Audrey

COMMERCIAL 1A.
MISS VICKERY.

Abrahams, Kitty
Adams, Merle
Anderson, Betty
Angus, Mavis
Baillot, Iris
Bassett, Nancy
Bayne, Rubina
Beale, Edna
Bishop, Gwen
Black, Nina
Blackburn, Vera
Bright, Jean
Button, Marjorie
Cadman, Claudia
Calder, Ruby
Campbell, Jean
Cashmore, Jean
Coughey, Esma
Chermside, Ivy
Christopher, Grace
Church, Betty
Clarke, Thelma
Coomer, Irma
Coppins, Nancy
Davies, Audrey
Double, Phyllis
Dunn, Gladys
Eagleson, Hilda
Eaton, Jean
Edmunds, Marjorie
Ferguson, Stella
Fortune, Freda
Fowler, Phyllis
Gilfillan, Jean
Gisby, Joan
Goble, Eileen
Goldsworthy, Jean
Goldsworthy, Joyce
Good, Iris
Gow, Margaret
Hay, Beryl
O'Conner, Rona
Perez, Jean
Rountree, Ann
Taylor, Joyce

COMMERCIAL 1B.

MISS CAMBRIDGE.

Brown, Alice
Greenwood, June
Gregory, Lorna
Hardwick, Dorothy
Hargreaves, Evelyn
Harvey, Betty
Hawkins, June
Heath, Betty
Hicks, Audrey
Hill, Madeline
Holbrook, Ruth
Hosking, Freda
Horton, Ailie
Hultquist, Joyce
James, Mollie
Jeffrey, Florence
Jessen, Beverley
Jones, Beryl
Jones, Christine
Kara, Kassey
Kewene, Mabel
Kean, Margaret
Keen, Peggy
Kennerly, Joan
Lake, Norah
Leek, Muriel
Lockley, Gladys
Maquire, Marjorie
Mahoney, Florence
Mattocks, Fay
Maxwell, Joan
Metcalfe, Joyce
Midgeley, Jean
Moore, Lois
Mueller, Alison
Macfarquhar, Marie
MacKay, Merlienne
MacPherson, Gladys
McLaren, Colina
McQueen, Hilda
McMahon, Joyce
Nannestad, Greta
Sims, Joan
Vine, Patricia

COMMERCIAL 1C.

MISS PILLING.

Brown, Daphne
Browne, Agnes
Burke, Lois
Conningham, Marion
Ford, Patricia
Gravill, Betty
Hindman, Dulcie
Leslie, Mavis
Marshall, June
Nilson, Joyce
North, Millicent
Oborn, Norma
O'Sullivan, Cecille
O'Sullivan, Doreen
Owen, Eleanor
Peate, Elaine
Pentland, Doris
Peterson, Norma
Powell, Evelyn
Probert, Joyce
Reefman, Betty
Robinson, Joan
Rowling, Rae
Ryan, Daisy
Scott, Iris
Sheffield, Yvonne
Smith, Kathleen
Stephenson, Poppy
Stewart, Joyce
Sullivan, Joan
Taylor, Betty
Taylor, Joyce
Thomas, Alva
Vandenberg, Joan
Waring, Bessie
Waterfield, Wendy
Wheeler, Betty
Whiteman, Patricia
Williams, Nancy
Wilson, Dorothy
Young, Florence
Doyle, Kathleen
Close, Eunice
Peterson, Kathleen

DOMESTIC COURSE—

DOMESTIC 3.

MISS STUBBS.

Arroll, Margaret
Christopher, Kathleen
Dwyer, Marie
Holden, Edith
Johnson, Pat
Le Long, Camille
Livingstone, Monica
Minola, Kathleen
McKenzie, Nancy
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Wilson, Roma
Bussey, Janet

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Brigham, Peggy
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Main, Norma
Magill, Margery
McKenna, Norma
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O'Shea, Geraldine
Scadden, Gwen
Tapp, Noelene
Taylor, Pattie
Watts, Joan
White, Nancy

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Davies, Pearl
Freeman, Joyce
Gallagher, Lorimer
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Harris, Joy
Higgins, Jean
Higgins, Kathleen
McKay, Margery
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Pilgrim, Doreen
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Rickard, Joyce
Shaldrick, Pat
Stubbing, Bonnie
Teixeira, Josephine
Wallbank, Vera
Wilson, Doris
Wilson, Dorothy

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Beaton, Hannah
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