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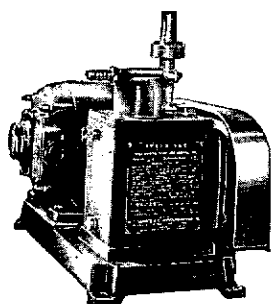
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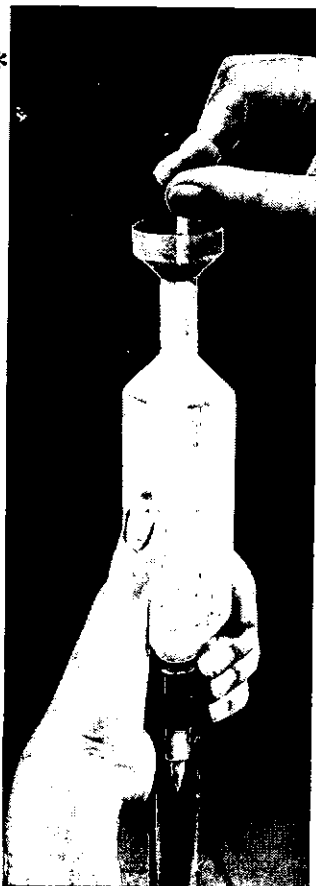
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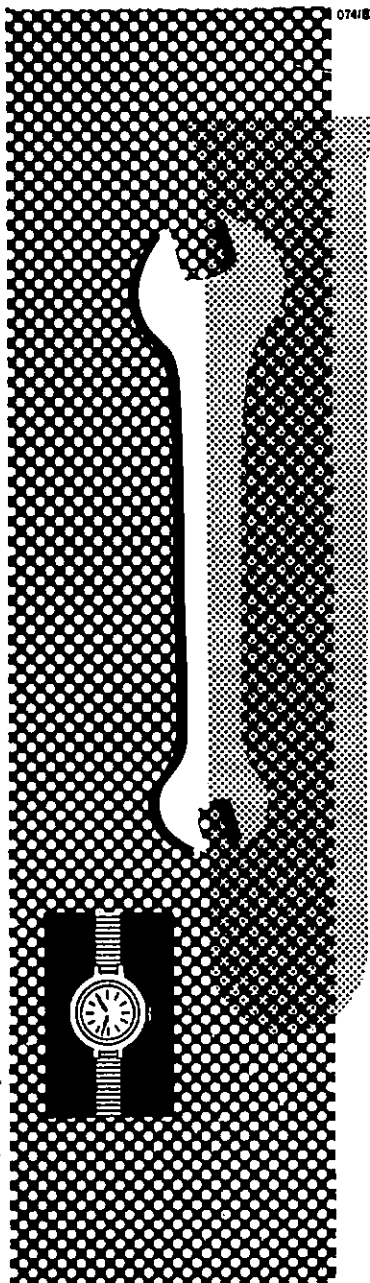
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VOICES IN UNISON

Early this year a group of senior technicians formed the Institute of Science Technology Inc., with the object of promoting the professional standing, efficiency and usefulness of laboratory technicians in New Zealand. This appears to have been stimulated by the recent introduction of technician training and certification under the Technician Certification Authority. For some years the N.Z. Association of Scientists, particularly through its Technicians Sub-committee, has actively sponsored the organization of technicians and the enlargement of the scope of science technician courses to cover fields other than chemistry. There appeared to be a danger that in future two bodies, which must inevitably be to some degree in competition, would be seeking to enhance the status of science technicians along very similar lines. It is pleasing to learn that these two groups have recently conferred and agreed to form one body, the N.Z. Institute of Science Technicians. An interim national committee has been set up to proceed with further organization and the Secretary (*Mr F. A. McNeill, Dominion Physical Laboratory, Lower Hutt*), will welcome enquiries from technicians in chemical laboratories who are interested in joining this new Institute.

Chemistry technicians have from the outset participated in Institute of Chemistry functions through local membership of branches. The Institute of Chemistry started the Laboratory Assistants' Certificate examinations about 20 years ago and more recently was a prime mover in the establishing of training in chemistry under the Technician Certification Authority. These and similar activities have been aimed at improving the standard and standing of chemical technicians. Formation by technicians of their own Institute is a logical development which should have the support of the Institute of Chemistry. By their decision to speak with one voice instead of two on matters affecting their common interests the technicians may be reading a lesson to their colleagues of professional status.

NEW DEVELOPMENTS IN THE FIELD OF FATS AND OTHER LIPIDS

(Concluded from previous issue)

F. B. SHORLAND

Director, Fats Research Laboratory, D.S.I.R., Wellington

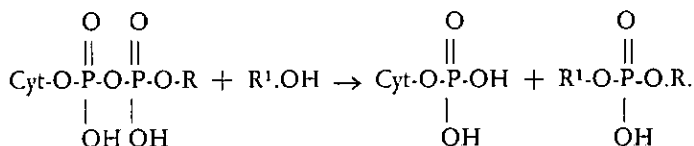
BIOSYNTHESIS OF TOTAL LIPID MOLECULES

The biosynthesis of the total lipid molecule has only comparatively recently been elucidated.

In general, the breakdown or hydrolysis of lipids is not the reverse of synthesis but each proceeds by a separate mechanism. Thus it is known that lipase will hydrolyse a fat or a triglyceride to form glycerol and fatty acids. On the other hand, the synthesis of fat in the liver occurs by a series of steps commencing with glycerol which in the presence of ATP forms L- α -glycerophosphate.

In adipose tissue and intestinal mucosa glycerokinase is absent and the L- α -glycerophosphate needed for the formation of triglyceride in these tissues is produced by the reduction of dihydroxyacetone phosphate—a glycolytic intermediate. The L- α -glycerophosphate thus formed is esterified with acyl CoA to yield phosphatidic acid. The enzyme concerned has been isolated from the sediment of the guinea-pig liver. Phosphatidic acids are not normally found in fresh tissues, probably owing to their rapid dephosphorylation to orthophosphate and D, 1, 2-diglyceride. An enzyme concerned with this reaction is found in chicken liver. D,1,2-diglyceride thus formed is transformed into a triglyceride by reacting with acyl CoA.

The D,1,2-diglyceride is also a precursor of phospholipids. The formation of the phosphate diester takes place via a cytidine-containing coenzyme thus:



This means that, generally speaking, the phosphate group present in phosphatidic acid is not utilized for the synthesis of phospholipids but the monophosphate diester linkage, an important structural feature of phospholipids, is generated *de novo*. Thus phosphatidyl choline and phosphatidyl ethanolamine are formed by the reaction of cytidine

diphosphate choline with diglyceride. On the other hand phosphatidylinositol is formed by the action of cytidine triphosphate on phosphatidic acid giving cytidine diphosphate diglyceride which then condenses with inositol to form phosphatidyl inositol. This means that the phosphate group of L- α -glycerophosphate is retained in phosphatidyl inositol.

In contrast the phosphate group of L- α -glycerophosphate is retained in the synthesis of phosphatidylinositol. The active component is cytidine diphosphate diglyceride which reacts with inositol.

The biosynthesis of the phospholipid known as cardiolipin is not yet worked out but certain probable steps are known. The first part of the proposed course involves, as in the synthesis of phosphatidylinositol, the formation of cytidine diphosphate diglyceride which reacts with L- α -glycerophosphate to form phosphatidylglycerophosphate. The product undergoes enzymatic dephosphorylation to phosphatidylglycerol. Phosphatidylglycerol itself appears not to accumulate in tissues and it is therefore suggested that it may act as a precursor of cardiolipin by undergoing a reaction with a second mole of cytidine diphosphate glycerol but no evidence for this last step has yet been obtained.

The phospholipids and triglycerides have thus been shown to be biogenetically related and stem from L- α -glycerophosphate with a common route through to the phosphatidic acid stage. Thereafter the phosphate group may be rejected to form diglyceride with subsequent addition of the acyl CoA to form triglyceride or the cytidyl phosphoryl base to form the phospholipids lecithin or phosphatidyl ethanolamine. On the other hand, the phosphate group of the original L- α -glycerophosphate may be retained as is phosphatidyl inositol. Here the cytidine diphosphate diglyceride reacts with inositol. Cardiolipin may also be formed from cytidine diphosphate glycerol, to give in the first instance the phosphatidyl glycerophosphate which in time becomes phosphatidyl glycerol and may then react, at least hypothetically, with a second molecule of cytidine diphosphate diglyceride to form cardiolipin.

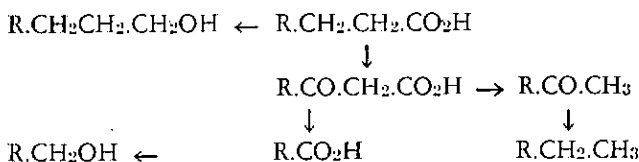
We now come to consider the sphingolipids or derivatives of the base sphingosine. Sphingosine itself is known to result from a condensation between palmitic aldehyde and L-serine, yielding dihydro-sphingosine which is then reduced to sphingosine. Acylation with Acyl-CoA leads to formation of ceramide which with cytidine diphosphate choline gives sphingomyelin. It is postulated that uridine diphosphate galactose gives cerebroside.

Latterly we have been concerned with a rather new lipid field, namely the galactolipids. It is true that the cerebrosides, which have long been known, contain galactose and sometimes other hexoses such as glucose, but these compounds are really classifiable as derivatives of

the base sphingosine and may be called sphingolipids. By galactolipids I mean derivatives of galactosylglycerol. The first reported occurrence of these constituents was by Carter in 1956 in wheat starch. Subsequently these constituents were found by Zill and Harman, in spinach chloroplasts and by Benson and co-workers in *Chlorella*. It has been assumed that the acetone soluble lipids of leaves were triglycerides but arising from the work in the Fats Research Laboratory, mainly by Weenink, it was shown that the so-called fats of red clover and ryegrass at least contained galactose and were, in fact, similar to the constituents reported by Carter as occurring in wheat flour. Reinterpretation of some of my earlier work, as well as more recent investigations, have led us to conclude that fats, if present, are minor constituents of leaves, their place being taken by the linolenates of mono- and digalactosyl dilinolenates I and II. In addition Benson and co-workers have isolated a sulpholipid III from *Chlorella* as well as from plant tissues. This sulpholipid is the analogue of the mono-galactosyl diglyceride and has been shown by Weenink in this laboratory to occur in red clover leaves.

From what has so far been described, a start has been made on the elucidation of the mechanism of fatty acid biosynthesis and on the biosynthesis of some of the lipid molecules. I doubt whether there is any definite information on wax formation on which Chibnall expressed views some thirty years ago. He drew attention to the fact that, whereas the fatty acids and alcohols were invariably even-numbered, the associated hydrocarbons were odd-numbered.

In the scheme put forward by Chibnall and Piper, the *n*-fatty acid is reduced to the primary alcohol or is oxidized to give the β ketoacid, and hence either the *n*-fatty acid with two carbons less or the methyl ketone with one carbon less. On reduction the ketone would give the corresponding paraffin. Lower members of the methyl ketone series have been found in essential oils.



CORRELATION OF BIOLOGICAL ACTIVITY AND CHEMICAL STRUCTURE

It is not possible here to give detailed descriptions of other developments which are also proceeding rapidly, but a few examples are mentioned to indicate aspects which are being investigated.

In the field of mycobacteria, Lederer and his colleagues have made considerable progress in correlating the structures of complex lipids with their biological activity such as tubercle formation (phthienoic, mycoseric, and mycolic acids); toxicity; increased production of antibodies (wax D fraction of human virulent strain Brevannes, M.W. 54,000, yielding on saponification 50% mycolic acid and 50% peptidomuco-polysaccharide); and development of resistance to infection (phosphatidyl-inositol-dimannosides).

In a symposium held in London about a year ago, attention was drawn to the ionic properties of phospholipids and their significance in biological phenomena, including the control of enzyme action and permeability of cell membranes.

Phospholipids are also concerned with metabolic cycles. Thus the feeding of L-serine leads to the excretion of free ethanolamine which it replaces from phosphatidyl ethanolamine. Phosphatidyl serine but not free serine may be decarboxylated to form phosphatidyl ethanolamine. Phosphatidyl serine will bind cations at neutral pH while phosphatidyl ethanolamine has little capacity for this purpose under these conditions. Thus the interconversion of phospholipids leads to significant changes in physiological properties.

In describing new developments in the field of fats and other lipids I have concentrated largely on the aspect of biosynthesis of these compounds. This is partly because in this area the most spectacular changes have taken place and partly because the lipids cover too wide a field for their comprehensive treatment in one lecture. Whereas the lipids were formerly ill-defined chemically and their functions unknown great progress is now being made and with it a reappraisal of the role of lipids in biological phenomena.

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Citation of all relevant literature would require a large amount of space. In addition to references numbered in the text a few key papers of recent origin are also cited below.

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BIOSYNTHESIS OF FATTY ACIDS:

(a) *n*-Saturated fatty acids:

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I.C.I. PRIZE

The Directors of I.C.I. (N.Z.) Ltd. have increased the value of their annual prize, which is awarded by the Institute, to £50. The Institute is most grateful for this generous increase in the prize, which now becomes the most valuable prize awarded in chemistry in New Zealand.

Members are reminded that the closing date for all Institute prizes is April 15. Regulations governing the award of these prizes were published in the issue of the *Journal* for April, 1959 (p. 47), and were summarized in the December, 1961, issue. It should be noted, however, that the Chemical Essay has now been restricted to 5,000 words (see October, 1962, issue).

List of Members, 1962

ABBREVIATIONS USED

- A.Aust.I.M.M.—Associate, Australasian Institute of Mining and Metallurgy.
A.C.G.I.—Associate, City and Guilds Institute, London.
A.G.I.T.—Associate, Gordon Institute of Technology, Geelong, Victoria
Australia.
Agr. L.—Licentiate of Agriculture.
A.I.B.—Associate, Institute of Brewing.
A.I.M.—Associate, Institution of Metallurgists.
A.I.M.L.T.—Associate, Institute Medical Laboratory Technology.
A.I.M.M.—Associate, Institution of Mining and Metallurgy.
A.M.I.Chem.E.—Associate Member, Institution of Chemical Engineers.
A.M.I.Mech.E.—Associate Member, Institution of Mechanical Engineers.
A.M.Inst.F.—Associate Member, Institute of Fuel.
A.M.Inst.Gas E.—Associate Member, Institution of Gas Engineers.
A.M.N.Z.I.E.—Associate Member, New Zealand Institution of Engineers.
A.M.T.C.—Associate, Melbourne Technical College.
A.N.Z.E.I.—Associate, New Zealand Electronics Institute.
A.N.Z.I.M.—Associate, New Zealand Institute of Management.
A.N.Z.I.R.E.—Associate, New Zealand Institute of Refrigeration Engineers.
A.N.Z.I.W.—Associate, New Zealand Institute of Welding.
A.N.Z.L.A.—Associate, New Zealand Library Association.
A.O.S.M.—Associate, Otago School of Mines.
A.R.A.C.I.—Associate, Royal Australian Chemical Institute.
A.R.A.N.Z.—Associate, Registered Accountant, New Zealand.
A.R.C.S.—Associate, Royal College of Science.
A.R.I.C.—Associate, Royal Institute of Chemistry.
A.S.T.C.—Associate, Sydney Technical College.
A.T.I.—Associate, Textile Institute.
B.A.—Bachelor of Arts.
B.Agr.Sc.—Bachelor of Agricultural Science.
B.Agr.Sc.(Dairy Tech.).—Bachelor of Agricultural Science, Dairy Tech-
nology Option.
B.Chem.E.—Bachelor of Chemical Engineering.
B.Com.—Bachelor of Commerce.
B.E.—Bachelor of Engineering.
B.E.(Chem.).—Bachelor of Chemical Engineering.
B.H.Sc.—Bachelor of Home Science.
B.Med.Sc.—Bachelor of Medical Science.
B.Sc. Bachelor of Science.
Cand. and Doct. Exam.—Candidaats and Doctoraal Examination (Am-
sterdam).
C.B.E.—Commander of the Order of the British Empire.
Ch.B.—Bachelor of Surgery.

- C.O.P.—Certificate of Proficiency.
C.O.P.H.L.P.—Certificate of Proficiency, Hospital Laboratory Practice.
Dip.Bact.—Diploma in Bacteriology.
Dip.Chem.Eng.—Diploma in Chemical Engineering.
D.D.S.—Doctor of Dental Surgery.
Dip.Ed.—Diploma in Education.
Dip.Ind.Chem.—Diploma in Industrial Chemistry (University of Canterbury).
Dip.Eng.Chem.—Diploma in Chemical Engineering.
Dip.N.Z.Lib.Sch.—Diploma, New Zealand Library School.
D.I.C.—Diploma, Imperial College of Science and Technology.
D.Phil.—Doctor of Philosophy.
D.Sc.—Doctor of Science.
E.D.—Efficiency Decoration.
Fil.dr.—Doctor of Philosophy.
F.I.M.—Fellow, Institution of Metallurgists.
F.I.P.H.E.—Fellow, Institute of Public Health Engineers.
F.Inst.F.—Fellow, Institute of Fuel.
F.Inst.S.P.—Fellow, Institute of Sewage Purification.
F.N.Z.I.M.—Fellow, New Zealand Institute of Management.
F.R.A.S.—Fellow, Royal Astronomical Society.
F.R.I.C.—Fellow, Royal Institute of Chemistry.
F.R.S.A.—Fellow, Royal Society of Arts.
F.R.S.N.Z.—Fellow, Royal Society of New Zealand.
Ing.—Ingenieur, i.e. a University Practical Diploma at the Masterate level.
K.B.E.—Knight Commander of the Order of the British Empire.
LL.M.—Master of Laws.
M.A.—Master of Arts.
M.A.I.M.E.—Member, American Institute of Mining and Metallurgical Engineers.
M.App.Sc.—Master of Applied Science.
M.Aust.I.M.M.—Member, Australian Institute of Mining and Metallurgy.
M.B.—Bachelor of Medicine.
M.D.—Doctor of Medicine.
M.H.Sc.—Master of Home Science.
M.I.Chem.E.—Member, Institution of Chemical Engineers.
M.I.Min.E.—Member, Institution of Mining Engineers
M.Chem.Eng.—Master of Chemical Engineering.
M.Inst.F.—Member, Institute of Fuel.
M.P.S.—Member, Pharmaceutical Society.
M.S.A.Chem.I.—Member, South African Chemical Institute.
M.Sc.—Master of Science.
Mus.B.—Bachelor of Music.
O.B.E.—Officer of the Order of the British Empire.
Ph.D.—Doctor of Philosophy.

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- BAYLISS, Stuart Patrick, B.Sc., Ocean Beach Freezing Co. Ltd., Invercargill. (*Chemist*). A.'60.
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- BEATH, George Bentley, M.A., Dip.Ed., A.I.Ed.(Lond.), Dunedin Teachers' College, Dunedin. (*Principal*). A.'33.
- BECK, John Richard, B.Sc., N.Z. Breweries Ltd., Box 211, Wellington. (*Assistant Technical Manager*). A.'50.
- BELL, Muriel Emma, C.B.E., M.D., F.R.A.C.P., F.R.S.N.Z., Medical School, University of Otago, Dunedin. (*Nutritionist, Department of Health*). F.'41.
- BETTY, Stewart Morris, B.Sc., Dip.Ind.Chem., Empire Rubber Mills Ltd., c/o Woolston P.O., Christchurch. (*Manager*). A.'52.
- BIELSCHOWSKY, Marianne, Ph.D.(Freiburg), Medical School, University of Otago, Dunedin. (*Chemist to Cancer Research Department*). A.'51.
- BIGGS, Arthur Ian, M.Sc., F.R.I.C., The Cottage, Broadwater Rise, Guilford, Surrey, England (Federation of British Industries). A.'43.
- BIRRELL, Kenneth Stewart, M.Sc., A.R.I.C., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt (*Senior Soil Physicist*) A.'41.
- BISHOP, Charmian Jocelyn, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland (*Lecturer, temporarily overseas*). A.'60.
- BLACKIE, William John, M.Sc., F.R.I.C., United Nations Mission, D.I.T. Building, Dacca 2, East Pakistan (*F.A.O. Leader*). A.'33; F.'35.
- BLACKMAN, John Gary, M.Sc., Ph.D., Department of Medicine, Medical School, P.O. Box 913, Dunedin. A.'56.
- BLANC, Albert Damer Gibson, B.Sc., M.B., Ch.B., P.O. Box 91, Wanaka. (*Medical Practitioner*). A.'39.
- BLIGHT, Margaret Mary, M.Sc., Dominion Laboratory, Private Bag, Petone. (*Scientific Officer*). A.'62.
- BLOOM, Harry, D.Sc.(Melb.), Ph.D.(Lond.), D.I.C., F.R.A.C.I., Chemistry Department, University of Tasmania, Box 252C, Hobart, Australia. (*Professor*). A.'48; F.'60.

- BOLLARD, Edward George, B.Sc., Ph.D.(Cantab.), Fruit Research Station, D.S.I.R., Auckland. (*Plant Physiologist*). A.'53.
- BORTHWICK, Edwin Sloan, M.Sc., A.R.I.C., Shell Oil N.Z. Ltd., Box 2091, Wellington. (*Assistant Technical Adviser*). A.'36.
- BOUSTRIDGE, William, B.Sc., British Imperial Paints Ltd., Auckland. (*Chemist*). A.'61.
- BOWYER, Stephen Bernard, Mill Road, Otaki. (*Retired*). A.'31. Hon.M.
- BRASCH, Donald James, M.Sc., Ph.D.(Queen's), Dominion Laboratory, P.B. Petone. (*Scientific Officer*). A.'59.
- BREEN, John Newnan, Stratford Dairy Co. Ltd., P.O. Box 97, Stratford. (*Chemist*). A.'61.
- BRIDGMAN, Michael John, B.Sc., A.N.Z.I.M., N.Z. Wallboards Ltd., Christchurch. (*Manager*). A.'60
- BRIGGS, Lindsay Heathcote, D.Sc., D.Phil.(Oxon.), F.R.S.N.Z., F.A.N.Z.A.A.S., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Professor of Chemistry*). A.'33; F.'36.
- BRIGGS, Michael Harvey, B.Sc.(Liverpool), M.S.(Cornell), D.Sc.(N.Z.), Geology Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Senior Lecturer*). A.'61.
- BROOKER, Edgar George, M.Sc., Ph.D., Ivon Watkins Ltd., New Plymouth. A.'48.
- BROOKER, Stanley George, M.Sc., Abels Ltd., Box 9012, Newmarket, Auckland. (*Chief Chemist*). A.'42; F.'48.
- BROOKS, Robert Richard, B.Sc.(Hons.)(Bristol), Ph.D.(Capetown), A.R.I.C., Biochemistry Department, Massey College, Palmerston North. (*Lecturer*). A.'61.
- BROUGHTON, George Wilfred, B.Sc., McLeod Bros. Ltd., P.O. Box 908, Dunedin. (*Factory Manager*). A.'46.
- BROWN, Desmond Goble, M.Sc., Kempthorne Prosser & Co.'s, New Zealand Drug Company Ltd., P.O. Box 319, Dunedin, (*Chief Chemist, Pharmaceutical Laboratories*). A.'57.
- BROWN, Mrs. Kathleen Elizabeth, B.Sc., M.H.Sc., Hill Street South, Richmond, Nelson. (*Nelson Girls' College*). A.'49.
- BROWNE, Gavin Fair, M.Sc., Mobil Oil (N.Z.) Ltd., P.O. Box 73, Petone. (*Senior Chemist*). A.'61
- BROWNE, William Edward, B.Sc., Box 1367, Auckland. (*Chemist, Hardie Trading Co.*). A.'49.
- BROWNING, Allen Ransome, B.Sc., Fijian Ore Co. Ltd., P.O. Box 143, Lautoko, Fiji. (*Company Manager*). A.'51.
- BRUCE, James Arthur, "Montrose," Kimpton Road, Papatoetoe, Auckland, P.O. Box 31, Papatoetoe. (*Technical Consultant, Fertilisers and Farmers' Raw Materials etc.*). A.'32.

- BRUCE, Leonard Wainwright, B.Sc., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Senior Scientific Officer*). A.'51.
- BRUNDELL, James Evans, M.Sc., Auckland Grammar School. (*Science Master*). A.'41.
- BURNETT, Kenneth Robert, B.Agr.Sc.(Dairy Tech.), Kaipara Dairy Co. Ltd., P.O. Box 20, Helensville. (*Chief Chemist and Assistant Manager*).
- BURNS, Gary Robert, M.Sc., Chemistry Department, Victoria University of Wellington, P.O. Box 198, Wellington. (*Junior Lecturer*). A.'62.
- BURNS, Malcolm McRae, C.B.E., M.Sc., Ph.D.(Aberd.), Lincoln College, Christchurch. (*Principal*). A.'37; F.'43.
- BURTON, Hugh Stephen Nicholas Hay, B.Sc., A.N.Z.L.A., 120 Nicholson Road, Khandallah, Wellington. (*Head, Bibliographical Section, N.L.S.*). A.'44.
- BUTCHERS, John Barnard, M.Sc., c/o Technical Assistance Board, P.O. Box 274, Monrovia, Liberia. (*Professor of Chemistry, University of Monrovia*). A.'51.
- BUTKUS, Antanas, D.Agr.Sc.(Bonn). (*Overseas*). A.'60.
- BUTLER, Graham Wesley, M.Sc., Fil.dr.(Lund), Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North. (*Principal Scientific Officer*). A.'54.

C

- CAIN, Bruce Frank, M.Sc., Ph.D., D.Phil.(Oxon.), British Empire Cancer Research Laboratory, Cornwall Geriatric Hospital, Auckland. (*Senior Cancer Research Fellow*). A.'53.
- CAMBIE, Richard Conrad, M.Sc., Ph.D., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Lecturer, temporarily overseas*). A.'57.
- CAMPBELL, Arthur Derek, M.Sc., Ph.D., A.R.I.C., Chemistry Department, University of Otago, Dunedin. (*Senior Lecturer and Microanalyst*). A.'49; F.'62.
- CAMPBELL, Alistair Shand, M.Sc., P.O. Box 52, Lincoln College, Christchurch. (*Lecturer in Chemistry*). A.'59.
- CANDY, Bruce James, M.Sc., Kelston High School, New Lynn, Auckland. (*Science Master*). A.'60.

- CARNEGIE, Patrick Robert, B.Sc.(Hon.)(St. Andrews), University of Malaya, Singapore. (*Lecturer*). A.'59.
- CARR, Robert Melville, M.Sc., Chemistry Department, University of Otago. (*Assistant Lecturer*). (*Temporarily overseas*). A.'58.
- CARRIE, Maxwell Stuart, M.Sc., F.R.I.C., A.M.I.Chem.E., The Canterbury Frozen Meat Co., Ltd., P.O. Box 2, Belfast, Christchurch. (*Chemist*). A.'36; F.'58.
- CARTER, Charles Lyons, M.Sc., A.R.I.C., 134 Queen Street, Dunedin. (*Reader in Chemistry University of Otago—Retired*). A.'31; F.'43; Hon.M.
- CARTER, David Michael, M.Sc., B.A.L.M. Paints (N.Z.) Ltd., Hutt Road, Lower Hutt. (*Development Chemist*). A.'57.
- CARTER, Denver Milton, B.Sc., Rangitoto College, Mairangi Bay, Auckland. (*Assistant Master*). (*Overseas*). A.'60.
- CAUGHLEY, Frank Gordon, B.A., M.Sc., N.Z. Leather and Shoe Research Association, Private Bag, Lower Hutt. (*Research Officer*). A.'32.
- CAWLEY, Robert William, M.Sc., Wheat Research Institute, P.O. Box 1489, Christchurch. (*Assistant Director*). A.'49.
- CHAMBERLAIN, George, B.Sc., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Chemist*). A.'44
- CHAPMAN, Lewis Peter James, M.Sc., A.R.A.N.Z., Dairy Research Institute, Massey College P.O., Palmerston North. (*Chemist*). A.'48.
- CHAPPELL, Peter Lyndsey, M.Sc., A.R.I.C., Glaxo Laboratories (N.Z.) Ltd., P.O. Box 624, Palmerston North. (*Pharmaceutical Production Manager*). A.'51.
- CHARLTON, Philip Lewis Raymond, B.Sc., Department of Agriculture, Suva, Fiji. (*Senior Chemist*). A.'39.
- CHEESEMAN, Trevor Percival, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Teaching Fellow*). A.'62.
- CHILDS, William Edward, B.Sc., B.A.L.M. Paints Pty. Ltd., P.O. Box 60, Clayton, Victoria, Australia. (*Chemist*). A.'50.
- CHRISTENSEN, Max Theodore, M.Sc., Ph.D., Department of Chemistry, University of Canterbury, P.O. Box 1471, Christchurch. (*Senior Lecturer*). A.'50.
- CLARE, Norman Trevor, M.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Chief Biochemist*). A.'35; F.'47.
- CLARK, Percival James Comfort, M.Sc., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Deputy Director and Dominion Analyst*). A.'32; F.'61.
- CLEVERLEY, Barry, M.Sc., Ph.D., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Senior Scientific Officer*). A.'52.

- CLIMO, John Matheson, B.Sc., Swift and Co. Ltd., P.O. Box 2301, Auckland. (*Sales Representative*). A.'48.
- COCKBURN, Bruce Lindsey, M.Sc., Wellington College, Wellington, C.4. (*Assistant Master*). A.'58.
- COLEBROOK, Lawrence David, M.Sc., Ph.D., Chemistry Department, University of Rochester, Roch. 20, New York, U.S.A. A.'59.
- COLLINS, Alfred Drew, M.Sc.(Manc.), Trimol Laboratories Ltd., 71 Melrose Road, Mt. Roskill, Auckland, S.E.3. (*Chief Chemist*), A.'36.
- CONE, Edgar, M.Sc.(Lond.), A.R.C.S., D.I.C., A.R.I.C., H. W. Lawrence and Son Ltd., Chemical Service Laboratory, P.O. Box 33, Johnsonville, Wellington. (*Chemist*). A.'39.
- COOKE, Miss Alison Peevor, B.Sc., Dominion Laboratory, Private Bag, Petone. (*Scientific Officer*). A.'48.
- COOP, Ian Edward, M.Sc., D.Phil.(Oxon.), Lincoln College, Christchurch. (*Professor of Animal Husbandry and Vice-Principal*). A.'46; F.'60.
- COOPER, David Edward, M.Sc., 7 Crescent Road, Epsom, Auckland. (*Chemist, A.F.F. Co.*). A.'56.
- CORBAN, George Annis, B.Sc., R. & W. Hellaby Ltd., Auckland. (*Chemist*). A.'60.
- CORBETT, Robert Edward, M.Sc., Ph.D.(Cantab.), Chemistry Department, University of Otago, Dunedin. (*Reader*). A.'53; F.'60.
- CORNES, John Julian Stephen, B.A., B.Sc., Waitomo Portland Cement Co., Box 274, Te Kuiti. (*Senior Chemist*). A.'40; F.'49.
- COTTON, Stephen Richard James, Laboratory, Auckland City Council, Town Hall, Auckland. (*Chief Analyst and Filtration Supervisor*). A.'53.
- COUP, Mostyn Robert, B.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Biochemist*). A.'45.
- COX, Gerald Stanley, B.Pharm., Ph.D., Pharmacy Department, College of Advanced Technology, Costa Green, Birmingham 4, England.
- CRAIGHEAD, Pat Wylie, M.Sc., N.Z. Plywood (S.I.) Ltd., Mandeville Road, Riccarton. (*Manager, Particle Board Factory*). A.'59.
- CREAMER, Lawrence Kenneth, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- CROWLEY, Bernard John, B.Sc., Merck, Sharp and Dohme Ltd., P.O. Box 362, Lower Hutt. (*Production Manager*). A.'60.
- CROZIER, Henry William, M.Sc., Marathon Rubber Footwear Ltd., Christchurch. (*Chief Chemist*). A.'31.

D

- DACRE, Jack Craven, M.Sc., Ph.D.(Lond.), Pathology Research Unit, Medical School, University of Otago, Dunedin. (*Senior Research Officer, M.R.C.*). A.'45; F.'58.
- DASENT, Wilfred Effingham, M.Sc., Chemistry Department, Victoria University of Wellington, Box 196, Wellington. (*Senior Lecturer*). A.'51.
- DAVEY, Colin Lester, M.Sc., Ph.D.(Cantab.), Meat Research Institute, P.O. Box 617, Hamilton. (*Biochemist*). A.'62
- DAVIES, Edwin Braithwaite, M.Sc., Ph.D.(Aberd.), A.R.I.C., Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Senior Principal Scientific Officer*). A.'31; F.'52.
- DAVIES (Mrs.), Marjorie June, B.H.Sc., c/o Karitane Products Society, Melrose, Wellington. (*Chemist*). A.'58.
- DAVIS, Brian Reeve, M.Sc., Ph.D., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Lecturer*). A.'55.
- DAVIS, Graeme Frear, M.Sc., C.O.P. (*Hospital Laboratory Practice*), Drs. Brown and Lusk, Pathologists, 4A Symonds Street, Auckland. (*Biochemist*). A.'55.
- DAVIS, Leslie Harold, M.Sc., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Principal Scientific Officer, Toxicology*). A.'31.
- DAWES, Stuart Neil, B.Sc., Dominion Laboratory, P.B. Petone. (*Scientific Officer*). A.'54.
- DEARSLEY, William Leonard Melville, M.A.(Cantab.), Dominion Compressed Yeast Co. Ltd., Box 2106, Christchurch. (*Chief Chemist and Works Manager*). A.'31; F.'46.
- De BOER, Pieter Johannes, M.Chem.Eng.(Delft), International Paints of N.Z. Ltd., 4 Seatoun Heights Road, Wellington, E.5. (*Senior Chemist*). A.'54.
- DEMCHENKO, Mrs. Zinaida, Ing. Chemist (Kharkov), Griffin & Sons Ltd., P.O. Box 327, Lower Hutt. (*Chemist*). (A.'53).
- DEMCHENKO, Zosim, Ing. Chemist (Kharkov), Lever Bros. (N.Z.) Ltd., Private Bag, Petone. (*Laboratory Superintendent*). A.'53.
- DENMEAD, Colin Frank, B.Sc., Health Department, P.O. Box 5442, Auckland. (*Chemical Inspector*). A.'43.
- DENNIS, Rodney Arthur, B.Agr.Sc.(Dairy Tech.), Albertland Co-operative Dairy Co., Private Bag, Wellsford. (*Manager*). A.'57.

- DENNISON, John Scott, M.A., B.Sc., Dip.Ed., Otago Boys' High School. (*Science Teacher*). A.'60.
- DICK, David Andrew, M.Sc., 40 Gladstone Road, Dunedin, N.E.1. (*Chemist and Brewer, Wilson's Malt Extract Co., Willowbank, Dunedin*). A.'32.
- DINGLEY, George, M.Sc., Dominion Compressed Yeast Co., Ltd., Box 10, Auckland. (*Chief Chemist*). A.'40.
- DIXON, Joseph Keith, M.Sc., Ph.D.(Lond.), D.I.C., F.R.I.C., F.R.S.N.Z., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Director*). A.'36; F.'41.
- DOAK, Brian Wilfred, D.Sc., N.Z. Fertiliser Manufacturer's Research Association, Otara Research Station, Otahuhu, Auckland. (*Director*). F.'44.
- DOBSON, Alexander, B.Sc., A.R.A.N.Z., N.Z. Wallboards Ltd., 153A Balmoral Road, Auckland. (*Chief Chemist*). A.'49.
- DOLBY, Richard Malcolm, M.Sc., Ph.D.(Lond.), The Dairy Research Institute (N.Z.), Massey College P.O., Palmerston North. (*Chemist*) A.'48.
- DONE, James, M.Sc., Ph.D.(Lond.), Department of Biochemistry, Sydney University, Sydney, N.S.W., Australia. A.'60.
- DONOVAN, Christine Lesley, B.Sc., City Council Laboratory, P.O. Box 2199, Wellington. (*Chemist*). A.'59.
- DOROFÄEFF, Francis Desmond, B.Sc., Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Senior Scientific Officer*). A.'47.
- DRYDEN, John Willoughby, B.Sc., M.I.Chem.E., The Lactose Company of N.Z. Ltd., Kaponga R.D., Taranaki (*Factory Manager*). A.'46.
- DUNCAN, James Francis, M.A., M.Sc., D.Phil., D.Sc., Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Professor of Inorganic and Theoretical Chemistry*). F.'62.
- DUNCKLEY, Geoffrey Gordon, B.Sc., Nutrition Research Department, Medical School, P.O. Box 913, Dunedin. (*Research Officer*). A.'62.
- DUNCKLEY, James Vivian, B.Sc., Medical School, Pathology Department, University of Otago, Dunedin. (*Biochemist*). A.'51.
- DURHAM, Reginald Alexander, M.Sc., R. A. Durham Ltd., Box 9210, Newmarket, Auckland. (*Manufacturing and Consulting Chemist*). A.'48.

E

- EARL, William Brian, B.Sc., B.E.(Chem. Hons.), Chemical Engineering Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Assistant Lecturer*). A.'62.
- EDSON, Norman Lowther, B.Med.Sc., M.B., Ch.B., Ph.D. (Cantab.), F.R.S.N.Z., Medical School, University of Otago, Dunedin, C.I. (*Professor of Biochemistry*). A.'37; F.'43.
- EDWARDS, Henry Hanbury, Morcom Green & Edwards Ltd., Onehunga, Auckland. (*Technical Director*). A.'32; F.'49.
- ELDER, William Ross, M.Sc., Linwood High School, Aldwins Road, Christchurch. (*Head of Department of Biology*). A.'44.
- ELLIS, Albert James, M.Sc., Ph.D., Dominion Laboratory, D.S.I.R., P.B. Petone. (*Principal Scientific Officer*). A.'54; F.'62.
- ELLISON, Miss Dorothy Jean, M.Sc., A.R.A.C.I., Abbotsleigh School, Wharounga, Sydney, N.S.W. (*Senior Chemistry Mistress*). A.'32.
- ELPHICK, John Oliver, B.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Fuel Chemist*). A.'43.
- ENGLAND, Brian Daysh, M.Sc., Ph.D.(Lond.), Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Senior Lecturer*). A.'60.
- ENTWISTLE, Mrs Evelyn Ruth, B.Sc.(Hons.), Ph.D.(St. Andrews), A.R.I.C., Chemistry Department, School of Home Science, University of Otago, P.O. Box 56, Dunedin. (*Lecturer in Textiles*). A.'62.
- ERSKINE, John Malcolm, B.Sc.(Hons.) (Liverpool), Dairy Research Institute, Massey College, P.O., Palmerston North (*Bacteriologist*). A.'62.

F

- FASTIER, Frederick Noel, M.Sc., D.Phil.(Oxon.), F.R.I.C., Medical School, University of Otago, Dunedin, C.I. (*Associate Professor in Pharmacology*). A.'44; F.'61.
- FERGUSON, Jack Eric, M.Sc., Ph.D.(Lond.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Lecturer*). A.'60.

- FIELDER, Morice, D.Sc., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt, (Senior Principal Scientific Officer). A.'37.
- FIFE, Clifford Valmont, M.Sc., Soil Science Department, Massey College, Palmerston North. (Senior Lecturer and Head of Department). A.'33.
- FISCHER, Alfred, M.Sc., Ph.D., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (Senior Lecturer). A.'55.
- FITZGERALD, David Gerald, B.Sc., Imperial Chemical Industries (N.Z.) Ltd., P.O. Box 275, Lower Hutt. (Production Supervisor). A.'55.
- FORRESTER, Alan McCallum, B.Sc., N.Z. Refrigerating Co. Ltd., Islington, Christchurch. (Assistant Chemist). A.'53.
- FORSYTH, John Charles, N.Z. Refrigerating Co. Ltd., Islington, Christchurch. (Chief Chemist). A.'31.
- FOSTER, Peter Kinnear, M.Sc., Ph.D., D.I.C., Dominion Laboratory, D.S.I.R., Private Bag, Petone (Senior Scientific Officer). A.'59.
- FRANCE, John Terence, M.Sc., Central Laboratory, Auckland Public Hospital. (Biochemist). (Overseas). A.'61.
- FRANCIS, Graeme Cecil, B.Sc., Mobil Oil (N.Z.) Ltd., P.O. Box 73, Petone. (Manufacturing Chemist). A.'59.
- FRASER, John Gareth, Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North. (Technical Officer). A.'58.
- FREITAG, Walter, M.Sc., B.P. (New Zealand) Ltd. Laboratory, P.O. Box 892, Wellington. (Chemist). A.'60.
- FREYBERG, Ernest, B.Sc., Dip.Chem.Ing.(Vienna), 9 Kebbelle Grove, Lower Hutt. (Technical Manager, Batavian Rubber Co. Ltd., Brown Street, Upper Hutt). A.'44.
- FRIEBERG, Alan George, M.Sc., A.R.I.C., 42 Nottingham Street, Westmere, Auckland, W.2. (Chief Chemist, Dairy Laboratory, Department of Agriculture). A.'39.
- FRIEBERG, George Frederick, A.R.A.C.I., 81 West End Road, Westmere, Auckland, W.2. (Retired). A.'31, Hon.M.
- FUTTER, John Herbert, M.Sc., H. W. Lawrence & Son Ltd., P.O. Box 33, Johnsonville. (Chemist). A.'59.
- FYFE, William Sefton, M.Sc., Ph.D., University of California (Professor of Geochemistry). A.'52.

G

- GALLAHER, Philip James, B.Sc., Fertiliser Manufacturers' Research Association, Otara Research Station, Otahuhu, Auckland. (Chemist). A.'48.

- CALLOWAY, Warren John, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- GAMBLE, Thomas Palmer Jackson, B.Sc.(Hons.)(Belfast), Pinchin, Johnson & Co. Ltd., Miramar, Wellington. (*Research Chemist*). A.'59.
- GAPPER, Harry Richmond, M.Sc., Peach Products Ltd., Otahuhu, Auckland, S.E.7. (*Chief Chemist*). A.'49.
- GARDNER, Kenneth Hurst, N.Z. Standards Institute, Department of Industries and Commerce, Wellington. (*Technical Officer, Chemical*). A.'62.
- GARDNER, Roy, D.Sc., M.I.Chem.E., F.R.I.C., Dr. R. Gardner and Partners Ltd., 41 Dowling Street, Dunedin. (*Consulting Industrial Chemist*). A.'31; F.'35.
- GARLICK, Raymond Kevin, B.Sc., Fletcher Industries Ltd., Box 1168, Christchurch. (*Chemist*). A.'52.
- GAY, Selwyn Roy, Southland Co-op Phosphate Co., Box 849, Invercargill. (*General Manager*). A.'31.
- GEDDES, Mrs. June Moyra, M.Sc., 113 Donald Street, Karori, Wellington. A.'54.
- GEE, Roy, M.Sc., Glaxo Laboratories (N.Z.) Ltd., P.O. Box 624, Palmerston North. (*Assistant Pharmaceutical Production Manager*). A.'55.
- GERSON, Thomas, M.Sc., Fats Research Laboratory, D.S.I.R., Wellington. (*Chemist*). A.'50.
- GIBBONS, Ronald Clifton, M.Sc., B.A.L.M. Paints (N.Z.) Ltd., Hutt Park Road, Lower Hutt. (*Technical Officer*). A.'39.
- GIBSON, Milton George Charles, M.Sc., Dominion Laboratory, P.O. Box 2224, Auckland, C.1. (*Chemist*). A.'57.
- GILMORE, Owen Lawry, B.A., B.Sc., Senior Lecturer, Post Primary Dept., Auckland Teachers' College, Epsom Avenue, Auckland. (*Lecturer in Science*). A.'53.
- GLENDINNING, Tom Aldrich, M.Sc., F.R.I.C., 14 Alton Street, Nelson, (*Retired*). A.'31.
- GLOVER, Richard Brian, B.Sc.(Hons.), Ph.D.(Bristol), Dominion Laboratory, c/o Ministry of Works, Wairakei. (*Scientific Officer*). A.'61.
- GOLDING, Raymond Marshall, M.Sc., Dominion Laboratory, Private Bag, Petone (*Scientific Officer*). A.'59.
- GOODEY, John Hill, M.Sc., The Laboratory, Auckland Gas Co. Ltd., P.O. Box 34, Auckland. (*Chief Chemist*). A.'53.
- GORDON, Lyndsey George McDonald, B.Sc., Takapuna Grammar School, Auckland (*Science Teacher*). A.'62.
- GORGENYI, George Zoltan, Davis Gelatine (N.Z.) Ltd., Christchurch. (*Works Chemist*). A.'61.

- GRAHAM, Joseph Ivon, M.A.(Cantab.), M.Sc.(Lond.), F.R.C.Sc.I., F.Inst.F., Hon.M.I.Min.E., F.R.I.C., "The Hill", Anakiwa, Picton, R.D., Marlborough. (Retired). F.'49.
- GRANT, Peter Kemnitz, M.Sc., Ph.D.(Cantab.), Chemistry Department, University of Otago, P.O. Box 56, Dunedin. (*Lecturer*). A.'62
- GREENWOOD, Roger Michael, M.Sc., Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North (*Scientific Officer*). A.'45.
- GREGORY, Elizabeth, M.H.Sc., Ph.D.(Lond.), Home Science School, University of Otago, Dunedin. (*Retired; formerly Professor of Home Science*). A.'39; F.'43.
- GREGORY, Lloyd Patrick, Dominion X-Ray & Radium Laboratory, P.O. Box 1456, Christchurch. (*Chemist*). A.'50.
- GRIFFIN, Donald John, M.Sc., Central Technical College, Petone. (*Assistant Master*). A.'59.
- GRIFFIN, Kenneth Massy, M.Sc., F.R.I.C., 29 Ridings Road, Remuera, Auckland, S.E.2. (*Retired, formerly Government Analyst, Auckland*). A.'31; F.'43.
- GRIGG, Felix John Theodore, M.Sc., F.R.I.C., 61 Friend Street, Wellington, W.3. (*Retired, formerly Director, Dominion Laboratory, and Dominion Analyst*). F.'43.
- GRIGG, John Lawrence, M.Sc., S.I. Soil Testing Station, Taieri Agriculture Centre, Private Bag, Mosgiel. (*Officer-in-Charge*). A.'44.
- GRIMMETT, Murray, Ross, M.Sc., Biochemistry Department, Massey College, Palmerston North. (*Assistant Lecturer*). A.'61.
- GRIMMETT, Robert Edmund Richard, M.Sc., 55 Cashmere Avenue, Wellington, N.5. (*Retired*). A.'31; F.'34.
- GROOM, Philip Stanley, B.Sc., Dominion Laboratory, D.S.I.R., c/o Ministry of Works, Wairakei. (*Scientific Officer*). A.'60.
- GUMBLEY, Miss Janice Marjorie, M.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Scientific Officer*). A.'62.

H

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- HALL, David, M.Sc., Ph.D., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Senior Lecturer*). A.'51.

- HALL, Ronald Berners, M.Sc., c/o N.Z. Forest Products Ltd., Private Bag, Auckland. (*Works Chemist, Penrose*). A.'59.
- HALLIBURTON, Gavin Jack, M.Sc., A.N.Z.I.M., Commercial Cleaners Co., Ltd., 112 Wordsworth Street, Christchurch. (*Chemist and Factory Manager*). A.'50.
- HANGER, William George, M.Sc., Ph.D.(Cantab.), Pathology Research Department, Medical School, University of Otago. (*Senior Research Officer*). A.'59.
- HANSEN, Roy Penrose, B.Sc., Fats Research Laboratory, D.S.I.R., Sydney Street, Wellington. (*Principal Scientific Officer*). A.'46.
- HAPPER, Duncan Alan Robert, B.Sc.(Hons.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- HARLAND, Charles William, M.Sc., N.Z. Farmers' Fertiliser Co., 106 Mays Road, Onehunga, Auckland. (*Chief Chemist and Acid Plant Supervisor*). A.'53.
- HARRALL, Edward Douglas, Christchurch Milk Co. Ltd., P.O. Box 351, Christchurch. (*Assistant Chemist*). A.'59.
- HARTMAN, Leopold, M.Sc., B.Chem.E.(Lwow), D.Sc., Fats Research Laboratory, D.S.I.R., Wellington. (*Principal Scientific Officer*). A.'49.
- HARTSHORN, Michael Philip, B.Sc.(Hons.), D.Phil.(Oxon.), University of Canterbury, P.O. Box 1471, Christchurch. (*Lecturer*). A.'61.
- HARVEY, Mrs. Helen Elizabeth, M.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Senior Scientific Officer*). A.'51.
- HARVEY, William Edward, M.Sc., Ph.D.(Cantab.), Chemistry Department, Victoria University of Wellington, Box 196, Wellington. (*Senior Lecturer*). A.'53.
- HAWKE, John Clement, M.Sc., Ph.D.(Cantab.), Massey Agricultural College, Palmerston North. (*Senior Lecturer in Biochemistry*). A.'59.
- HAWTHORN, John Crawford, M.Sc., Formica (N.Z.) Ltd., Papakura, Auckland. (*Works Chemist*). A.'60.
- HAYWARD, John Elliott, B.Sc., Colonial Ammunition Co. Ltd., Box 8511, Upper Symonds Street P.O., Auckland. (*Chief Chemist*). A.'45.
- HEALY, William Bernard, M.Sc., Ph.D.(Rutgers), Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Soil Chemist*). A.'50.
- HEBDEN, William Herbert, B.Sc., New Zealand Foods Ltd., P.O. Box 583, Hastings. (*Development Manager*). A.'50.
- HERRMANN, Mrs. Romana, M.Phil. in Chem. (Warsaw), Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Scientific Officer*). A.'51.

- HICKS, Ronald, A.R.I.C., F.I.P.H.E., F.Inst.S.P. Auckland Metropolitan Drainage Board, P.O. Box 208, Auckland, C.I. (*Chief Chemist*). A.'52.
- HIGGINS, Desmond James, B.Sc., A.M.I.Chem.E., Kempthorne Prosser and Co.'s N.Z. Drug Co., Hornby, Christchurch. (*Chief Production Officer, All Works*). A.'50.
- HILLS, Dennis Ashley, B.Sc., Empire Rubber Mills, Woolston, P.O., Christchurch. (*Chemist*). A.'60.
- HINDMARSH, William Ewan, B.Sc., Mair & Co. Importers Ltd., Box 1152, Auckland. (*Technical Representative*). A.'60.
- HITCHINGS, Terence Richard, M.Sc., Riccarton High School, Curletts Road, Christchurch. (*Senior Science Master*). A.'60.
- HOARE, John Leonard, M.Sc., Department of Textile Chemistry, The University, Leeds 2, England. A.'60.
- HODDER, Ivan George, B.Sc., N.Z. Forest Products Ltd., Private Bag, Tokoroa. (*Works Chemist*). A.'50.
- HODGE, Robert Alexander Paul, B.Sc., Auckland Gas Co. P.O. Box 34, Auckland. (*Assistant Chemist*). A.'62.
- HODGES, Richard, M.Sc., Ph.D.(Manc.), Ruakura Animal Research Station, Private Bag, Hamilton. (*Scientific Officer*). A.'62.
- HOE, Yuan Liang, B.E.(Chem.), B.Sc., Arthur Lowe Ltd., P.O. Box 13011, Auckland, S.E.5. (*Chemical Engineer*). A.'57.
- HOGAN, Denis James, B.Sc., C.O.P.(Dairy Chem. and Bact.), Dominion Laboratory, D.S.I.R., P.O. Box 2112, Christchurch. (*Scientific Officer*). A.'52.
- HOGG, Donald Elvery, B.Sc., Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Senior Scientific Officer*). A.'46.
- HOLLAND, Harold Cecil, M.Sc., Ph.D.(Leeds), F.R.I.C., W. Sutherland & Co. Ltd., P.O. Box 5026, Auckland. (*Managing Director*). F.'61.
- HOLLOWAY, John Thorpe, M.Sc., F.R.S.N.Z., Forest and Range Expt. Station, N.Z. Forest Service, Rangiora. (*Senior Principal Scientific Officer*). A.'44.
- HOLMES, Alexander Colin, B.Sc., M.I.Chem.E., The Lactose Company of N.Z. Ltd., P.O. Box 83, Hawera. (*General Manager*). A.'39.
- HOLMES, George Stevenson, M.Sc., 44 Litten Road, Howick, Auckland. (*Fletcher Industries Ltd.*). A.'44.
- HOOKE, Colin Newton, M.Sc., Imperial College, University of London. A.'57.
- HOOKE, Ronald Owen, B.Sc., N.Z. Foods Ltd., Box 583, Hastings. (*Industrial Chemist*). A.'59.

- HOPGOOD, Raymond Henry, B.Sc., Fletcher Manufacturing Co. Ltd., P.O. Box 60, Waterloo, N.S.W., Australia. (*Resident Director*). A.'58.
- HORN, Alexander Huntly, M.Sc., Lincoln College, Christchurch. (*Officer-in-charge, Chemical Services*). A.'52.
- HORNE, Philip Desmond, B.Sc., N.Z. Farmers' Fertiliser Co. Ltd., P.O. Box 41, New Plymouth. (*Chief Chemist and Acid Plant Superintendent*). A.'42.
- HOUNSELL, Eric Russell, M.Sc., University of Canterbury, Box 1471, Christchurch. (*Liaison Officer*). A.'41.
- HOUSE, Donald Alexander, M.Sc., Chemistry Department, Victoria University, P.O. Box 196, Wellington. (*Junior Lecturer*). A.'61.
- HOWARD, Dene Grenville, M.Sc., Shell Oil N.Z. Ltd., P.O. Box 1084, Auckland. (*Sales Technical Adviser*). (*Temporarily overseas*). A.'46.
- HOY, Kenneth Frederick, B.Sc., Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Agricultural Chemist*). A.'47.
- HUBBARD, Edmund Francis, Laboratory, N.Z. Railways, Hutt Shops, Woburn. (*Chief Chemist*). A.'54; F.'62.
- HUGHSON, Walter Gordon Mackenzie, M.Sc., M.Inst.F., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Senior Fuel Chemist*). A.'31; F.'43.
- HUGILL, Archie James, B.Sc., Ph.D.(Birm.), Scott & Bowne A'sia. Ltd., P.O. Box 124, Otahuhu, Auckland. (*Production Manager*). A.'61.
- HULLETT, Ernest William, M.Sc., Wheat Research Institute, P.O. Box 1489, Christchurch. (*Director*). A.'31; F.'43.
- HUNGERFORD, John Sealy, B.Sc., M.Inst.F., A.M.Inst.Gas.E., Wellington. Gas Company Ltd., P.O. Box 6070, Wellington (*Production Engineer*). A.'55.
- HUNT, Austen Hubert, M.Sc., c/o Perfection Ice Cream Co., 300 Manchester Street, Christchurch. (*Consulting Industrial Chemist*). A.'53.
- HUNT, Ian Sinclair, M.Sc., A.R.I.C., A.I.M., A.N.Z.I.W., Chief of Division of Wood Preservation, National Forest Products Laboratory, Faculty of Forestry, University of the Andes, Apartado 231, Merida, Venezuela. A.'41; F.'61.
- HUNTER, George John Ernest, M.Sc., F.R.I.C., Medical School, University of Otago, Dunedin. (*Senior Lecturer in Biochemistry*). A.'40.
- HUNTER, Jack Carlyle, A.R.A.C.I., Stedman Henderson's Sweets Ltd., 348 Rosebank Road, Avondale, Auckland. A.'62.
- HUNTER, Maurice, B.Sc., Dairy Division Grading Stores, Department of Agriculture, P.O. Box 90, New Plymouth. (*Chemist*). A.'56.
- HUNTER, Maxwell Thomas, B.Sc., Christchurch Gas Co. Ltd., Moorhouse Avenue, Christchurch. (*Analyst*). A.'59.

- HURST, Frank, M.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer, Organic*). A.'48.
- HUSHEER, Godfrey Asbjorn, B.Sc., Scientific Service Laboratories, P.O. Box 301, Napier. A.'59.
- HUTCHINSON, Robert Lewis, M.Sc., Lane, Walker and Rudkin Ltd., P.O. Box 992, Christchurch. (*Chief Chemist*). A.'48.
- HYATT, John Buchan, B.Sc.Agric.(Lond.), 37 Cooper Street, Karori, Wellington. (*Retired*). (A.'31).

I

- IVORY, Hugh Gordon, M.Sc., Lever Bros. (N.Z.) Ltd., Private Bag, Petone. (*Production Development Officer*). A.'53.

J

- JACKMAN, Richard Harry, B.Sc., Ph.D.(Iowa), Grasslands Division, D.S.I.R., Private Bag, Palmerston North. (*Principal Scientific Officer*). A.'51.
- JACKSON, Barrie Edward, B.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Senior Scientific Officer, Petroleum Products*). A.'37.
- JACKSON, Douglas Wright, B.Sc., Challenge Phosphate Co., Otahuhu Auckland. (*Chief Chemist*). A.'57.
- JACKSON, Miss Phyllis Rosalind, M.H.Sc., Dip.Ed., Home Science School University of Otago, Dunedin. (*Senior Lecturer*). A.'40.
- JACOBSON, Paul Robert, M.Sc., Chemical Products (N.Z.) Ltd., G.P.O. Box 1955, Wellington. (*Director*). A.'52.
- JAGGER, Lewis Woodhead, M.Sc., Westfield Freezing Co. Ltd., Private Bag, Auckland, C.I. (*Chemist*). A.'41.
- JAKOBSSON, Bjorn Frithiof, B.E.(Chem.), B.Sc., Lever Brothers (N.Z.) Ltd., Private Bag, Petone. (*Production Manager*). A.'55.
- JAMES, Lionel Harry, M.Sc., 121 Remuera Road, Remuera, Auckland, S.E.2. (*Retired*). A.'31; F.'36.
- JAMIESON, Norman Danford, M.Sc., N.Z. School of Pharmacy, Central Institute of Technology, Petone. (*Tutor in Chemistry*). A.'45.
- JEBSON, Richard Selwyn, B.E.(Chem.), B.Sc., Dairy Research Institute, Massey College P.O., Palmerston North. (*Chemical Engineer*). A.'57.

- JESSOP, Edwin Charles, A.R.I.C., Glaxo Laboratories (N.Z.) Ltd., P.O. Box 624, Palmerston North. (*Chief Analyst*). A.'51.
- JOBEY, Desmond Ernest, B.A., B.Sc., Selwyn College, Auckland (*First Assistant and Head of Science Department*). A.'62.
- JOHANNESON, John Ker, M.Sc., A.R.I.C., Seddon Memorial Technical College, Wellesley Street, Auckland. (*Senior Lecturer in Chemistry*).
- JOHNS, Alan Tutton, M.Sc., Ph.D.(Cantab.), A.R.I.C., Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North. (*Director*). A.'49; F.'60.
- JOHNSON, Archibald Frederick, B.Sc. (*Retired; formerly Science Master, Christchurch Boys' High School*). A.'31. A.'46; F.'60.
- JOHNSON, Cecil Barry, M.Sc., Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Research Student*). A.'62.
- JOHNSON, Colin Truscott, B.Sc., Southland Co-op. Phosphate Co., P.O. Box 849, Invercargill. (*Chief Chemist*). A.'62.
- JOHNSON, Alexander Lawrence, M.Sc., Chemistry Department, University of Rochester, U.S.A. A.'58
- JOHNSTONE, Francis Henry George, M.B.T. Products (N.Z.) Ltd., C.P.O. Box 2106, Christchurch. (*Company Manager*). A.'31.
- JOINER, William Alexander, M.Sc., F.R.I.C., M.I.Chem.E., Head Office, D.S.I.R., P.O. Box 8018, Wellington. (*Deputy Secretary*). A.'31; F.'43.
- JONES, Brian Ogilvie, B.Sc., N.Z. Forest Products, Private Bag, Auckland. (*Chemist, Production*). A.'51.
- JONES, Clarence Desmond Burson, B.Sc., Onewhero District High School, Onewhero. (*Teacher*). A.'53.
- JONES, Ronald Sydney, M.Sc., 32 Douglas Street, Timaru. (*Science Master, Timaru Boys' High School*). A.'44.
- JUSTICE, Edmond Alexander, Dip.Ing.Chem.(Zurich), Guild Rubber Co., P.O. Box 5008, Papanui, Christchurch. (*Company Manager*). A.'39.

K

- KELSEY, Oliver James, M.Sc., 18 Buckland Beach Road, Buckland's Beach, Auckland. A.'52.
- KENNEDY, Alister Miles, B.Sc., B.E.(Chem.), Ph.D.(Cantab.), A.M.I. Chem.E., Chemistry Department, University of Otago, Dunedin. (*Senior Lecturer in Applied Chem.*) A.'57.

- KENNEDY, John Wallace, A.G.Inst.Tech., A.R.A.C.I., N.Z. Farmers' Fertilizer Co Ltd., P.O. Box 759, Auckland. (*Works Manager*). A.'57.
- KENNEDY, Thomas Henry, M.Sc., Thyroid Research Department, Medical School, University of Otago, Dunedin. (*Chemist*). A.'39.
- KENNERLEY, Rowland Alfred, M.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer*). A.'50; F.'62.
- KERR, Ivan James, M.Sc., Buckley and Young Ltd., P.O. Box 2411, Wellington. (*Technical Sales Representative*). A.'62.
- KEYES, Alfred William, B.Sc., Government Transport Department, Civic Chambers, Cuba Street, Wellington. (*Engineer*). A.'31.
- KEYS, Oswald Hilton, M.Sc., A.R.I.C., Dominion Laboratory, P.O. Box 2224, Auckland. (*Government Analyst*). A.'32.
- KIDDLE, Kenneth Walter, M.Sc., M. and K. Kiddle, Orchardists, Box 14, Havelock North. A.'46.
- KIDSON, Elsa Beatrice, D.Sc., F.R.I.C., Cawthron Institute, P.O. Box 175, Nelson. (*Senior Chemist, Soil Bureau, D.S.I.R., Seconded to Cawthron Institute*). A.'31; F.'43.
- KIDSON, John Oxley, M.Sc., Dip.Ed., Christchurch Boys' High School, Straven Road, Christchurch. (*Senior Science Master*). A.'39.
- KING, Donald Wilford, B.E.(Chem.), B.Sc., Dairy Research Institute, Massey College P.O., Palmerston North. (*Chemical Engineer*). A.'61.
- KING, The Rev. Meyrick Vincent Bryan, M.Sc., 6 Ettrick Street, Oamaru. (*Assistant Curate, Oamaru*). A.'36.
- KINGSFORD, Michael, M.Sc., N.Z. School of Pharmacy, Petone. (*Lecturer*). A.'59.
- KIRK, David Neville, B.Sc.(Hons.), Ph.D.(Lond.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Lecturer in Organic Chemistry*). A.'62.
- KITT, Watson, B.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Scientific Officer*). A.'51.

L

- LAMB DEN, Alfred Edward, B.Sc., A.R.I.C., A.Inst.S.P., Christchurch Drainage Board, P.O. Box 406, Christchurch. (*Chief Chemist*). A.'32.
- LAMBERT, George Stanley, M.Sc., F.I.M., Hayes Metal Refineries Ltd., P.O. Box 9029, Newmarket, Auckland, S.E.I. (*Metallurgist and Works Manager*). A.'34; F.'60.

- LAMBOURNE, Sydney James, M.Sc., Dip.Ed., Department of Education, Box 4001, Hamilton. (*District Senior Inspector of Post Primary Schools*). A.'39; F.'59.
- LANCASTER, Robert Julian, M.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Senior Biochemist*). A.'39.
- LATIMER, Graeme Bruce, B.E.(Chem.), B.Sc., Dairy Research Institute, Massey College P.O., Palmerston North. (*Chemical Engineer*). A.'61.
- LAW, Brunel Robert, A.R.A.C.I., c/o P.O. Box 2503, Wellington. (*Retired formerly Managing Director and Deputy Chairman, I.C.I. (N.Z.) Ltd.*). A.'53.
- LAW, Norman Heyworth, M.Sc., F.R.I.C., Meat Industry Research Institute of N.Z. (Inc.), P.O. Box 617, Hamilton. (*Director*). A.'47; F.'50.
- LAWRENCE, Gilbert Alexander, B.Sc., F.R.I.C., Chemical Service Laboratory, Johnsonville. (*Chairman Directors, H. W. Lawrence and Son Ltd.*). A.'31; F.'35.
- LAWRENCE, Robert Charles, B.Sc.(Hons.)(Lond.), Dairy Research Institute, Massey College P.O., Palmerston North. (*Biochemist*). A.'58.
- LAWRY, Robert Courtney, M.Sc., Brightwater, Nelson. (*Managing Director, W. L. Lawry Ltd., Lime Manufacturers*). A.'44.
- LEESE, Ernest, 76 Russell Road, Whangarei. (*Consultant Cement-Concrete and Allied Products*). A.'33; F.'34.
- LEIGHTON, Francis Royden, B.Sc.(Pretoria), N.Z. Co-operative Dairy Co., Box 459, Hamilton. (*Senior Assistant Chemist*). A.'59.
- LEONARD, John Henry, M.Sc., N.Z. Forest Products Ltd., Private Bag, Auckland. (*Research Chemist*). A.'60.
- LE QUESNE, Philip William, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Ph.D. Student*). A.'62.
- LEVER-NAYLOR, Peter, B.Sc., The Nestle Company (Australia) Ltd., 17 Foveaux Street, Sydney, N.S.W. A.'49.
- LEVIEN, Miss Barbara Joan, M.Sc., Chemistry Department, University of Western Australia, Perth, W.A. A.'46.
- LEWIN, Arthur Harry, B.Sc., Cadbury Fry Hudson Ltd., Castle Street, Dunedin. (*Chemist*). A.'53.
- LINZEY, John Trevillian, B.Sc., McSkimming Industries Ltd., P.O. Box 2001, Dunedin. (*Chief Chemist*). A.'44.
- LLEWELLYN, Donald Rees, D.Sc., D.Phil., F.R.I.C., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland (*Professor of Chemistry and Director of Chemical Laboratories*). F.'58.
- LLEWELLYN, Frederick John, B.Sc., Ph.D., D.Sc., Hon. LL.D.(Canterbury), F.R.I.C., F.R.S.A., Chairman, University Grants Committee, P.O. Box 8035, Wellington. F.'47.

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- LOCKHART, Douglas Watson, M.Sc., King's High School, Bay View Road, Dunedin. (*Science Teacher*). A.'54.
- LOE, John Anthony, M.Sc., N.Z. Forest Products Ltd., Private Bag, Tokoroa. (*Chlorine and Bleach Plant Manager*). A.'55.
- LONG, Miss Anwyn Margaret, M.Sc., I.C.I.A.N.Z., Central Research Laboratories, Newson Street, Ascot Vale, Victoria, Australia. (*Research Officer*). A.'58.
- LONGBOTTOM, Herbert Leslie, B.Sc.(Melb.), B.Sc., Glendernid Ltd., P.O. Box 40, Dunedin. (Tanners and Leather Merchants). (*Managing Director*). A.'38.
- LONSKA, Mrs. Maria, Ph.D.(Kharkov), S. W. Peterson and Co. Ltd., 165 Vivian Street, Wellington, C.2. (*Chemist*). A.'52.
- LYTTLETON, John Westcoate, M.Sc., Ph.D.(Lond.), Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North. (*Senior Chemist*). A.'54.

M

- McANELLY, Francis Patrick, B.Sc., Shell Co. of N.Z. Ltd., Hutt Road Laboratory, Wellington. (*Chemist in Charge*). A.'58.
- McCABE, William James, B.Sc., Radiochemical Research Laboratory, The Grove, Wantage, Berks, England. (*Research Fellow*). A.'57.
- McCHESNEY, John William, M.Sc., 8 Alison Crescent, Dunedin, N.W.I. (*Head of Science Dept., Otago Boys' High School*). A.'51.
- McCLURE, Denis, M.P.S.(Hon.), F.N.Z.I.M., D. McClure and Associates, P.O. Box 36, New Lynn, Auckland. (*Principal*). A.'49.
- McCOMBS, Terence Henderson, M.Sc., A.R.I.C., Cashmere High School, Rose Street, Christchurch, S.W.I. (*Headmaster*). A.'31; F.'59.
- McCONNON, Peter Alan, M.Sc., Mainland Products Ltd., P.O. Box 397, Dunedin. (*Manager*). A.'54.
- McCRAW, Ralph Henry, M.Sc., The Lactose Co. of N.Z. Ltd., Kaponga, R.D., Taranaki. (*Assistant Chemist*). A.'58.
- McCURDY, Alan Underwood, B.A., B.Sc., Post-Primary Department, Teachers' College, Christchurch. (*Senior Lecturer in Chemistry*). A.'61.
- McDONALD, Ian Robert Clark, M.Sc., A.R.I.C., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer*). A.'50.

- McDOWALL, Frederick Henry, O.B.E., M.Sc., D.Sc. (Lond.), F.R.S.N.Z., The Dairy Research Institute (N.Z.), Massey College P.O., Palmerston North. (*Chief Chemist and Deputy Director*). F.'45.
- McDOWALL, Ian Campbell, M.Sc., School of Architecture, University of Melbourne (*Research Fellow in Ceramics*). A.'45.
- McDOWELL, Arthur Keith Ralph, M.Sc., A.R.I.C., The Dairy Research Institute (N.Z.), Massey College P.O., Palmerston North. (*Chemist*). A.'31; F.'50.
- McGILLIVRAY, William Anderson, M.Sc., Ph.D., The Dairy Research Institute (N.Z.), Massey College P.O., Palmerston North. (*Chief Bacteriologist*). A.'44; F.'52.
- McGIMPSEY, James Raymond, M.Sc., A.M.I.Chem.E., A.R.I.C., Davis Gelatine (N.Z.) Ltd., Connal Street, Woolston, Christchurch. (*Production Manager*) A.'51.
- McINTOSH, Ian Gordon, B.Sc., Wallaceville Animal Research Station, Private Bag, Wellington. (*Senior Principal Scientific Officer*). A.'36.
- McKEE, Tasman Joseph, B.Sc., M.Aust.I.M.M., Fruitgrowers' Chemical Co. Ltd., Lime and Marble Ltd., and Buller Uranium Ltd., Port Mapua, Nelson. (*Managing Director*). A.'46.
- McKEEGAN, William Relph, M.Sc., Dip.Ind.Chem., Aulsebrooks Ltd., P.O. Box 357, Christchurch. (*Chemist*). A.'51.
- McKENZIE, Graham Smith, B.Sc.; Southland Cement Co., Orawia. (*Chief Chemist*). A.'58.
- MACKNEY, Alan William, M.Sc., (Sydney), F.R.A.C.I., N.Z. Forest Products Ltd., Private Bag, Auckland. (*General Manager (Penrose) and Chief Chemist*). A.'44.
- McLEAN, Donald Hugh, M.Sc., Ross & Glendinning Ltd., Roslyn Woollen Mills, P.O. Box 606, Dunedin. (*Chemist*). A.'45.
- MACLEAN, Dorothy Margaret, B.Sc., Pathology Department, Public Hospital, Wellington. (*Biochemist*). A.'59.
- McMILLAN, Roger Maxwell, B.Sc., Buckley and Young Ltd., Box 2411, Wellington. (*Chemist*). A.'60.
- McNAUGHT, Kenneth John, M.Sc., Rukuhia Soil Research Station, P.O. Box 490, Hamilton, (*Principal Scientific Officer*). A.'35.
- McNAUGHTON, Graeme Stuart, M.Sc., Ph.D., Institute of Nuclear Sciences, Private Bag, Lower Hutt. (*Scientific Officer*). A.'60.
- MAHON, William Anthony John, M.Sc., Dominion Laboratory, Private Bag, Petone. (*Scientific Officer*). A.'62.
- MALCOLM, Geoffrey Norman, M.Sc., Ph.D. (Manc.), Chemistry Department, University of Otago, P.O. Box 56, Dunedin. (*Lecturer*). A.'60.
- MALCOLM, Miss Marion Eveline, B.Sc., Dip.Ed., 6 Kenya Street, Wellington, N.4. (*Examiner, Patent Office, Wellington (Chemistry)*). A.'46.

- MALTHUS, Rex Sydenham, B.Sc., Nutrition Research Department, M.R.C., Medical School, University of Otago, Dunedin. (*Research Chemist*). A.'51.
- MANN, Bartholomew Robin, M.Sc., Ph.D., G. L. Bowron & Co. Ltd., P.O. Box 886, Christchurch (*Research Chemist, Leather Industry*) A.'62.
- MANDENO, John Leighton, M.Sc., A.R.I.C., G. H. Jackson & Co. Ltd., Box 1772, Wellington. (*Chief Chemist*). A.'34.
- MANSELL, James Lindsay, M.Sc., Mobil Oil (N.Z.) Ltd., P.O. Box 2497, Wellington. (*Chief Chemist*). A.'59.
- MARSH, Benjamin Bruce, M.Sc., Ph.D.,(Cantab), Meat Industry Research Institute of N.Z. (Inc.), Box 617, Hamilton. (*Biochemist*). A.'52.
- MARSHALL, Thomas, B.E.; B.Sc., A.O.S.M., A.I.M.E., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Senior Metallurgist*). A.'55.
- MARTIN, Charles George, M.Sc., A.M.I.Chem.E., A.M.N.Z.I.E., A.M. Inst.F., 223 Mt. Pleasant Road, Christchurch. (*Consulting Chemical Engineer*). A.'49.
- MARTIN, Gerald Francois Louis, B.Sc., Wellington Meat Export Co. Ltd., Box 190, Wellington. (*Works Manager*). A.'44.
- MARTIN, Gordon Calder, M.Sc., Southland Boys' High School, Invercargill. (*Head of Science Department*). A.'42.
- MARTIN, James Keith, M.Sc., Ph.D., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. A.'55.
- MASKILL-SMITH, Gordon, M.Sc., A.R.I.C., M.I.Chem.E., A.M.N.Z.I.E., N.Z. Wallboards Ltd., 153A Balmoral Road, Auckland, S.2. (*General Manager*). A.'38.
- MASLEN, Hugh Stafford, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Senior Lecturer*). A.'50.
- MASON, Cecil George Wilmott, A.R.I.C., A.M.I.Chem.E., N.Z. Forest Service, P.O. Box 894, Wellington (*Chemical Engineer*). A.'31; F.'59.
- MASON, William John, B.Sc., Institute of Nuclear Sciences, Private Bag, Lower Hutt. (*Scientific Officer*). A.'62.
- MASTERS, Colin John, M.Sc., C.O.P.H.L.P., University of Queensland, Brisbane. (*Lecturer in Biochemistry*). A.'53.
- MATHESON, Robert Archibald, M.Sc., Ph.D., Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Lecturer*). A.'53.
- MATHIESON, Cecil John, M.Sc., N.Z. Forest Products Ltd., Private Bag, Auckland. (*Assistant Chief Chemist*). A.'52.
- MATTHEWS, Richard Ellis Ford, M.Sc., Ph.D., F.R.S.N.Z., Microbiology Department, University of Auckland, P.O. Box 2175, Auckland. (*Professor of Microbiology*). A.'60.

- MATTINGLEY, Miss Joan Muriel, B.Sc., C.O.P.H.L.P., Pathology Department, Public Hospital, Wellington. (*Biochemist*). A.'58.
- MAYNE, Alan John, M.Sc., Lever Bros. (N.Z.) Ltd., Private Bag, Petone. (*Chief Chemist*). A.'62.
- MEREDITH, Peter, M.Sc., Ph.D.(Birmingham), Wheat Research Institute, P.O. Box 1487, Christchurch. (*Principal Scientific Officer*). A.'60
- MERRICK, Miss Sheila, B.Sc.(Lond.), 8 Cherry Orchard, New Road, Amersham, Bucks, England. A.'52.
- METCALF, Mrs. Mary Glen, M.Sc., Full-Time Medical Unit, the Princess Margaret Hospital, Christchurch. (*Biochemist*). A.'62.
- METCALF, Walter Sidney, Mus.B., M.Sc., D.Phil.(Oxon.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Senior Lecturer*). A.'41.
- METSON, Alan James, M.Sc., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Principal Scientific Officer*). A.'40.
- MILBURN, Ronald McRae, M.Sc., Ph.D., Dept. of Chemistry, Boston University, Boston 15, Massachusetts, U.S.A. (*Assistant Professor*). A.'55.
- MILLER, Ronald Bruce, B.A., M.Sc., Agr.L.(Sweden), Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Senior Soil Chemist*). A.'46.
- MITCHELL, Colin Donald, M.Sc., N.Z. Forest Products Ltd., Private Bag, Tokoroa. (*Chemist*). A.'58.
- MITCHELL, Thomas Alexander, M.Sc., Wheat Research Institute, P.O. Box 1489, Christchurch. (*Scientific Officer*). A.'52.
- MOFFAT, Duncan Ernest, M.Sc., 6 Sheehy Grove, Wainuiomata. (*Chemist, Mobil Oil (N.Z.) Ltd., Wellington*). A.'47.
- MOFFAT, Johnstone Flucker, B.A., M.Sc., Rangiora High School, Rangiora. (*Principal*). A.'31.
- MOIR, George Morrison, M.Sc., Ph.D.(Reading), F.R.I.C., 231 Main Road, Upper Hutt (*Retired*). A.'50.
- MOLLOY, James Joseph, M.Sc., East Coast Farmers' Fertiliser Co., P.O. Box 392, Napier, (*Production Superintendent and Chief Chemist*). A.'53.
- MONIGATTI, John David William, M.Sc., A.R.I.C., King's College, Box 12, Otahuhu, Auckland, S.E.7. (*Senior Chemistry Master*). A.'48.
- MONK, Robert Joseph, B.Sc., Nelson City Council Gasworks, Nelson. (*Chemist*). A.'50.
- MONRO, Alexander Donald, M.Sc., A.R.I.C., Seaview Road, Paremata, (*Formerly Associate Professor, Chemistry Department, Victoria University of Wellington*). A.'31; F.'34; Hon. Fellow '61.
- MOONEY, Eric Allan, B.Sc., Hayes Metal Refineries Ltd., P.O. Box 9029, Newmarket, Auckland. (*Assistant Chemist*). A.'52.

- MOORE, Francis Hugh, M.Sc., A.E.R.E. Harwell, England. (*Research Fellow*). A.'60.
- MOORE, John Brian, B.Agr.Sc., Canterbury Frozen Meat Co. Ltd., P.O. Box 2, Belfast. (*Chemist*). A.'60.
- MOORE, William Alexander, B.Sc., B.A.L.M. Paints Ltd., P.O. Box 1609, Auckland. (*Technical Officer*). A.'62.
- MORGAN, Bernard Ramon, B.Sc., 158 Pembroke Road, Wellington, W.2. (*Sales representative, Dewey and Almy*). A.'55.
- MORGAN, Francis, M.P.S., Wellington Drug Co. Ltd., Box 6023, Wellington. (*Managing Director*). A.'40.
- MORICE, Isobel Murray, M.Sc., Ph.D.(Lond.), Fats Research Laboratory, D.S.I.R., Wellington. (*Senior Scientific Officer*). A.'42.
- MORRIS, Harley Alton Lyal, B.Sc., Dept. of Food Technology, Massey College, Palmerston North. (*Senior Lecturer*). A.'49.
- MORRISON, Dan Alexander, M.Sc. (*Overseas*). A.'60.
- MORTON, Ian Douglas, M.Sc., Ph.D.(Cantab), F.R.I.C. 77 Chaucer Road, Bedford, England. A.'44; F.'55.
- MOUSTAFA, Esam, M.Sc., Ph.D.(Cantab.), Plant Chemistry Division, D.S.I.R., Private Bag, Palmerston North. (*Senior Scientific Officer*). A.'61.
- MUIR, George Robert, B.Sc., A.R.A.C.I., Young Street, Mooroolbarna, Victoria, Australia. (*General Manager, Ardmona Fruit Products Co-op Ltd.*). A.'46.
- MUMMERY, William Rest, F.R.I.C., The Dairy Research Institute (N.Z.) Massey College P.O., Palmerston North. (*Chemist*). A.'52.

N

- NAISH, Geoffrey, B.Sc.(Birm.), Palmerston North Boys' High School. (*Teacher*). A.'62.
- NASH, James Archibald Delacourt, M.Sc., Head Office, D.S.I.R., P.O. Box 8018, Wellington. (*Principal Scientific Officer*). A.'35.
- NAUEN, Oskar Max Fritz, Dr.Ing.(Munich). (*Retired, Overseas*). A.'44.
- NELSON, Donald Frederick, M.Sc., C.O.P. (Dairy Bact., Dairy Chem., Dairy Pract.), Dominion Laboratory, P.O. Box 2224, Auckland. (*Senior Scientific Officer*). A.'46.
- NEVIN, Ronald Bruce, B.Sc., D.D.S., Department of Health, Christchurch. (*Principal Dental Officer*). A.'51.

- NICHOLLS, Gordon Alfred, M.Sc., Ph.D., N.Z. Forest Products Ltd., Private Bag, Auckland. (*Chief Research Chemist*). A.'48; F.'62.
- NOBLE-CAMPBELL, Vincent Cedric, B.Sc., National Carbon Pty. Ltd., Wellington. (*Industrial Chemist*). A.'60.

O

- OAKLEY, Henry Brazenor, B.Sc.(Lond.), 30 Palmerston Street, Hamilton. (*Chief Chemist, Waikato Breweries, Hamilton*). A.'45.
- OATS, Owen John, B.Sc., New Plymouth Boys' High School, New Plymouth. (*Science Teacher*). A.'59.
- OCCLESHAW, Frederick Ernest, c/o British Phosphate Commission, Nauru, Central Pacific. (*Analyst*). (*Retired*). A.'33.
- O'CONNOR, Rev. Father Kevin Augustine, B.Sc., St. Bede's College, Christchurch. (*Senior Chemistry Master*). A.'59.
- ODELL, Allan Lloyd, M.Sc., Ph.D.(Lond.), Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Associate Professor*). (*Temporarily overseas*). A.'43.
- O'KANE, John McDonald, M.Sc., Tasman Vaccine Laboratory Ltd., P.O. Box 29, Upper Hutt. (*Chemist*). A.'54.
- OLDFIELD, Samuel Langdon, B.Sc., Auckland Farmers' Freezing Co. Ltd., Southdown, Auckland. (*Chemist*). A.'53.
- OLIVER, Arthur Pleasant, M.Sc., N.Z. Breweries Ltd., Box 211, Wellington. (*Chief Chemist*). A.'45.
- OLIVER, William Haldane, M.Sc., M.P.S., Pharmacy College, 59 Cambridge Terrace, Wellington. (*Principal*). A.'50.
- OLLIFF, Raymond Walter, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Lecturer*). A.'56.
- ORCHISTON, Hector Douglas, M.Sc., Chilean Nitrate Sales Corporation Pty. Ltd., Caltex House, Kent Street, Sydney, N.S.W., Australia. (*Managing Director*). A.'44.
- OSGERBY, Leonard, 62 Campbell Street, Palmerston North. (*Chemist, Kiwi Bacon Co., Ltd.*). A.'42.
- OXLEY, Frank William, B.Sc., Reckitt, Colman, Nuggett (N.Z.) Ltd., Forth Street, Dunedin. (*Works Chemist*). A.'53.

P

- PACKER, John, M.Sc.(Melb.), D.I.C., Hon.D.Sc.(Canterbury), F.R.I.C., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Professor of Chemistry*). A.'31; F.'34.

- PACKER, John Edward, M.Sc., Ph.D.(Lond.), Chemistry Dept., University of Auckland, P.O. Box 2175, Auckland (*Lecturer*). A.'61.
- PAGE, Roland Burnard, B.Sc., A.R.I.C., Dairy Division, Department of Agriculture, Auckland. (*Chemist*). A.'58.
- PAGE, Sally Grace, M.Sc., c/o Department of Biophysics, University College, London. (*Assistant Lecturer in Biophysics*). A.'59.
- PAIN, Eric Douglas, B.Sc., 19 Clark Street, Khandallah, Wellington. (*Science Master, Education Department, Correspondence School*). A.'35.
- PANCKHURST, Max Humphrey, M.Sc., Ph.D., D.Phil., Chemistry Department, University of Otago, P.O. Box 56, Dunedin. (*Lecturer*). A.'52.
- PARKER, Mrs. Rani Estelle, B.Sc., Pathology Department, Public Hospital, Wellington (*Biochemist*). A.'60.
- PARR, Percy Reginald, M.Sc., W. & R. Fletcher (N.Z.) Ltd., Private Bag, Auckland, C.I. (*Chief Chemist*). A.'31; F.'41.
- PARTON, Hugh Noble, M.Sc., Ph.D.(Lond.), Chemistry Department, University of Otago, Dunedin. (*Professor of Chemistry*). A.'31; F.'39.
- PASTELIDIS, Demetre, B.Sc.(Athens), Shell Company of N.Z. Ltd., P.O. Box 2091, Wellington (*Chemist*). A.'58.
- PATCHETT, Graham Andrew, B.Sc., Mobil Oil (N.Z.) Ltd., P.O. Box 1709, Auckland (*Sales Chemist*). A.'56.
- PATERSON, Richard Maunsell Logan, M.Sc., 101 Jane Drive, Syracuse 9, New York, U.S.A. A.'50.
- PATTINSON, Mervyn Edward, Thos. Borthwick & Sons (A'Asia) Ltd., P.O. Box 9, Feilding. (*Chief Chemist*). A.'46.
- PAULIN, William Thomas Holmes, B.Sc., Milburn Lime & Cement Co., Ltd., Burnside, Dunedin. S.W.2. (*Works Manager*). A.'43.
- PENFOLD, Bruce Russell, M.Sc., Ph.D.(Cantab.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Senior Lecturer*). A.'53.
- PENHALE, Hugh Russell, M.Sc., Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Chemist*). A.'49.
- PERRIN, Mrs. Dawn Roberta, M.Sc., A.R.I.C., Division of Plant Industry, C.S.I.R.O., Box 109, Canberra, A.C.T., Australia. (*Chemist, Microbiology Section*). A.'45.
- PERRY, Keith David, B.Sc.(Hons.)(Bristol), Ph.D.(Reading), Biologicals Division, Aplin & Barrett Ltd., Yeovil, Somerset, England. A.'59.
- PETERS, George William, B.Sc., Felt and Textiles of N.Z. Ltd. P.O. Box 848, Wellington. (*Manager, Product Development*). A.'57.
- PETERSEN, George Bouet, M.Sc., D.Phil.(Oxon.), Dept. of Biochemistry, Oxford University, England). A.'60.

- PHILLIPS, Leon Francis, M.Sc., Ph.D., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Lecturer*). A.'62.
- PITCAITHLY, Ngata Prosser, M.A., Dip.Ed., Selwyn College, Kohimarama Road, Auckland, E.1. (*Principal*). A.'31.
- POLLARD, John Scott, B.Sc., Dip.Ind.Chem., A.M.I.Chem.E., British Pavements (Canty.) Ltd., P.O. Box 5524, Hornby, Christchurch. (*Chemical Engineer*). A.'48; F.'62.
- POPE, Christopher George, B.Sc.(Hons.), Ph.D., A.R.C.S., D.I.C., Chemistry Department, University of Otago. (*Assistant Lecturer*). A.'62.
- POPPELBAUM, Adalbertus Henricus, Westfield Freezing Co. Ltd., Private Bag, Auckland. (*Chemist*). A.'59.

Q

- QUICKENDEN, Terence Ivan, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.

R

- RADCLIFFE, Cedric Burton, M.Sc., A.R.I.C., Cullin Laboratories (N.Z.) Ltd., P.O. Box 624, Palmerston North. (*Development Manager*). A.'31.
- RADFORD, Peter John, B.Sc., c/o Thomson Research Associates, 53 Shaw Street, Toronto, Ontario, Canada. (*Laboratory Manager*). A.'56.
- RAFTER, Thomas Athol, O.B.E., M.Sc., A.R.I.C., F.R.S.N.Z., Institute of Nuclear Sciences, D.S.I.R., Private Bag, Lower Hutt. (*Director*). A.'43.
- RAMAGE, Bruce Bower, B.Sc., Teacher's College, P.O. Box 615, Palmerston North. (*Lecturer in Mathematics*). A.'57.
- RAMMELL, Colin George, B.Sc.(Hons.)(Birmingham), Dairy Laboratory, Wallaceville. (*Bacteriologist*). A.'61.
- RANDS, Henry, M.A., B.Sc., 382 Karori Road, Wellington, W.3. (*Retired*). A.'31; F.'34; Hon.M.
- RANDS, Maxwell Barrett, M.Sc., Southdown Laboratory, Auckland Farmers' Freezing Co. Eilerslie, Auckland, S.E.6. (*Chief Chemist*). A.'37; F.'57.
- RANKIN, Hugh McDougall, A.S.T.C., Dip.Ind.Chem. and Chem.Engrn., N.Z. Breweries, P.O. Box 23, Auckland. (*Brewer*). A.'54.
- REID, Mrs. Mary Ruth, M.Sc., 117 Watford Street, Papanui, Christchurch. (*Part-time Assistant Lecturer, Chemistry Department, University of Canterbury*). A.'59.

- RICHARDS, Edward Leonard, M.Sc., Ph.D.(Bristol), Biochemistry Department, Massey College P.O., Palmerston North. (*Senior Lecturer*). A.'56.
- RICHARDS, Nolan Earle, M.Sc., Ph.D., Reduction Research Laboratory, Reynolds Metal Co., P.O. Box 191, Sheffield, Alabama, U.S.A. (*Research Physical Chemist*). A.'54.
- RICHARDSON, George Maxwell, M.Sc., D.Sc.(Lond.), Ph.D.(Lond.), D.I.C., National Health Institute, 52-62 Riddiford Street, Wellington, S.I. (*Research Officer*). A.'49.
- RICKARD, Donald Stuart, M.Sc., Winchmore Irrigation Research Station, Private Bag, Ashburton. (*Officer-in-charge, Laboratory*). A.'50.
- RICKETTS, James, M.Sc., A.R.I.C., 27 Mahoe Avenue, Remuera, Auckland. (*Chief Chemist, Dominion Breweries Ltd., Otahuhu*). A.'36.
- RIGG, Sir Theodore, K.B.E., M.Sc., M.A.(Cantab.), Hon.D.Sc.(W.A. and N.Z.), F.R.S.N.Z., F.R.I.C., 5 Taupata Street, Stoke, Nelson. (*Retired, formerly Director, Cawthron Institute*). A.'31; F.'41; Hon.F.'56.
- RITCHIE, John Adolph, B.Sc.(Edin.), Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer, Minerals*). A.'50.
- ROBB, Alexander John Donaldson, M.Sc., Fletcher Industries Ltd., F.O. Box 67, Dunedin. (*Works Manager*). A.'51.
- ROBB, James, M.Sc., Glendernid Tannery Ltd., Sawyers Bay, Dunedin. (*Works Chemist*). A.'49.
- ROBERTS, Charles Clarence, M.Sc., Department of Education, Private Bag, Auckland. (*Senior Inspector of Post-primary Schools*). A.'36.
- ROBERTSON, Peter Struan, M.Sc., Ph.D.(Reading), The Dairy Research Institute (N.Z.), Massey College P.O., Palmerston North. (*Microbiologist*). A.'53.
- ROBINSON, Michael Alan, M.A., B.Sc.(Oxon), A.R.I.C., International Paints, P.O. Box 7520, Kilbirnie, Wellington. (*Chief Chemist*). A.'59.
- ROBINSON, Robert Anthony, O.B.E., D.Sc.(Birm.), Ph.D.(Birm.), F.R.I.C., National Bureau of Standards, Washington 25, D.C., U.S.A. F.'45.
- ROBINSON, Ward Thomas, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- ROGERS, Mrs. Beryl Edith Winifred, B.Sc.(Hons.), Medical Unit, Wellington Public Hospital. (*Biochemist*). A.'61.
- ROGERS, John, Ph.D.(Cantab.), M.Sc., M.A.I.M.E., M.Aust.I.M.M., c/o Chemistry Department, University of Otago, Dunedin. (*Senior Principal Scientific Officer, Geological Survey*). A.'46.
- ROLT, William Frederick, B.Sc.(Lond), Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Chemist*). A.'47.
- RONALDSON, John William, M.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Senior Scientific Officer*). A.'47.

- ROPER, Warren Richard, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- ROSS, Desmond Joseph, M.Sc., Ph.D.(Lond.), Dip.Bact.(Lond.), Soil Bureau, Private Bag, Lower Hutt. (*Senior Principal Scientific Officer*). A.'48.
- ROSS, Miss Joan Barnard, M.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Fuel Chemist*). A.'45.
- ROTHBAUM, Henry Peter, B.A., M.Sc., Ph.D.(Liverpool), Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer*). A.'48.
- RUDDLE, Leslie William, c/o H. F. Stevens Ltd., Wholesale Druggists, 103 Worcester Street, Christchurch, C.I. A.'33; F.'41.
- RUSHWORTH, George Edward, M.Sc.(Leeds), 88 Kauri Street, Wellington, E.4. (*Chief Chemist, B.P. (New Zealand) Ltd.*). A.'48.
- RUSSELL, Gordon Richard, C.S.I.R.O., Division of Biochemistry and General Nutrition, University of Adelaide, Adelaide, South Australia. (*Experimental Officer*). A.'61.
- RUSSELL, Graeme Baxter, B.Sc.(Hons.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- RUSSELL, William Ernest, M.Sc., A.R.I.C., M.I.Chem.E., N.Z. Farmers' Fertiliser Co. Ltd., Te Papapa, Auckland. (*Works Superintendent*). A.'43.
- RUTLEDGE, Peter Stewart, M.Sc., University of Michigan, Ann Arbor, Michigan, U.S.A. (*Research Associate*). A.'60.
- RYBURN, Graham Middleton, B.Sc., Lever Bros., Private Bag, Petone. (*Industrial Chemist*). A.'60.

S

- SAMPEY, Miss Elizabeth Margaret, B.Sc., Biochemistry Department, University of Queensland, St. Lucia, Brisbane, Australia. (*Demonstrator*). A.'58.
- SANDERS, John Donald, B.Sc.(Hons.), Ph.D.(Leeds), A.R.I.C., Coates Brothers (N.Z) Ltd, PO Box 12068, Penrose, Auckland (*Chief Technical Manager*). A.'62.
- SANDLE, Henry William, B.Sc., McSkimming Industries, P.O. Box 2001, Dunedin. (*Assistant Chemist*). A.'49.

- SARGENT, John Driessen, M.Sc., Massey College P.O., Palmerston North. (*Head, Microbiology Department*). A.'61.
- SAUNDERS, William Munro Hutchison, M.Sc., Ph.D. (Aberd.), Soil Bureau, D.S.I.R., Private Bag, Lower Hutt. (*Soil Chemist*). A.'50.
- SCHMIDT, Richard Otto, B.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Chemist*). A.'58.
- SCOTT, Gordon Randall, M.Sc., Dominion Laboratory, D.S.I.R., Box 562, Dunedin, C.I. (*Government Analyst*). A.'47.
- SCOTT, Raymond Annesley, M.Sc., Dip.Ed., Takapuna Grammar School, Auckland. (*First Assistant*). A.'51.
- SCRYMGEOUR, Alastair Neil, B.Sc., A.I.B., Irvine & Stevenson St. George Co. Ltd., P.O. Box 113, Dunedin. (*Factory Manager*). A.'57.
- SEAL, Kenneth Edmund, M.Sc.(Lond.), Amalgamated Brick and Pipe Co. Ltd., Box 4, New Lynn, Auckland, S.W.4. (*Chief Technical Officer*). A.'52.
- SEARLE, Ernest Johnstone, M.Sc., D.Sc., 26 Waiohua Road, Auckland, S.E.4. (*Senior Lecturer in Geology, University of Auckland*). A.'48.
- SEELYE, Ralph Nicholson, M.Sc., Chemistry Department, University of Auckland, Box 2175, Auckland. (*Senior Lecturer in Chemistry*). A.'45.
- SEGAL, Wolfe, M.Sc., Ph.D.(Melb.), Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Lecturer*). A.'61.
- SELFE, Geoffrey Reginald, Bay of Plenty Co-op. Fertilizer Co. Ltd., Private Bag, Mount Maunganui. (*General Manager*). A.'53.
- SELKIRK, Ronald Charles, M.Sc., A.R.I.C., Dominion Breweries, Otahuhu, Auckland. (*Chemist*). A.'49.
- SEWELL, Owen Keith, M.Sc., Ph.D.(Birm.), A.R.I.C., Ivon Watkins Ltd., Buller Street, New Plymouth. (*Chief Chemist*). A.'48.
- SHAND, Allan Douglas, B.Sc., B.Agr.Sc., A.N.Z.I.M., D. H. Brown and Son, Christchurch. (*Technical Manager*). A.'54.
- SHEAT, David Edwin Gordon, M.Sc., Ph.D.(Manc.), Botany Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Senior Lecturer*). A.'60.
- SHEAT, Sylvia Vine, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Temporary Junior Lecturer*). A.'62.
- SHEPHERD, Ronald Henry, M.Sc., A.M.N.Z.E.I., Imperial Chemical Industries (N.Z.) Ltd., P.O. Box 1592, Wellington. (*Technical Officer*). A.'46.
- SHORLAND, Francis Brian, O.B.E., M.Sc., Ph.D.(Liv.), D.Sc.(Liv.), F.R.S.N.Z., Fats Research Laboratory, D.S.I.R., Wellington. (*Director*). A.'33; F.'43.

- SIEMON, Stanley Robert, B.Sc.(Queensland), M.App.Sc.(Queensland), M.I. Chem.E., A.R.A.C.I., University of Canterbury, P.O. Box 1471, Christchurch. (*Professor of Chemical Engineering*). A.'44; F.'58.
- SIMPSON, William Stanley, M.Sc., Ph.D.(Leeds), Dominion Laboratory, Private Bag, Petone. (*Defence Science Corps*). A.'61.
- SINCLAIR, Robert Malcolm, M.Sc., Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Principal Scientific Officer*). A.'47.
- SINCLAIR, Roy Lanham, B.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Junior Lecturer*). A.'62.
- SINHA, Anandi Prasad, Vill Sosandi, P.O. Sonsa, Patna District, Bihar State, India. (A.'61).
- SIRETT, Nancy Elliot, B.Sc., Endocrinology Research Unit, Medical School, P.O. Box 913, Dunedin. (*Research Officer*). A.'61.
- SKELTON, Charles Derek, M.Sc., Auckland Public Hospital (*Manager, Intravenous Solutions*). A.'60.
- SLATER, Stanley Nelson, M.Sc., D.Phil.(Oxon.), F.R.I.C., Chemistry Department, Victoria University of Wellington, P.O. Box 196, Wellington. (*Professor of Chemistry*). A.'38; F.'49.
- SLEEMAN, Geoffrey Russel, M.Sc., Chemical Products (N.Z.) Ltd. (*Director*). A.'60.
- SMITH, Miss Jane Birch, B.H.Sc., Otago Girls' High School. (*Teacher*). A.'62.
- SMITH, Michael Francis, M.Sc., Shell Oil N.Z., Ltd., P.O. Box 1084, Auckland. (*Industrial Chemist*). A.'58
- SMITH, Robert Frederick, M.Sc., Chemistry Department, University of Otago. (*Ph.D. Student*). A.'62.
- SNELL, Wynne Arbuthnot, B.Sc., N.Z. Co-op Rennet Co. Ltd., P.O. Box 57, Eltham. (*Chief Chemist*). A.'57.
- SOMERVILLE, William Campbell, B.Sc.(Hons.)(Edin.), Ph.D.(Edin.), Chemistry Department, University of Otago, P.O. Box 56, Dunedin. (*Part-time Lecturer*). A.'61.
- SOPER, Frederick George, C.B.E., Ph.D., D.Sc.(Wales), F.R.I.C., F.R.S. N.Z., University of Otago, Dunedin. (*Vice-Chancellor*). F.'36.
- SOUTHWARD, Charles Ramsay, M.Sc., N.Z. Fertiliser Research Association, Otahuhu, Auckland. (*Research Chemist*). A.'62.
- SPACKMAN, Leonard Storkey, 501 R.S.A. Buildings, High Street, Auckland, C.I. (*Public Analyst and Consulting Chemist*). A.'31.
- SPROTT, Thomas James, M.Sc., Ph.D., 53 King George Avenue, Auckland, S.E.3. (*Consultant*). A.'48.
- SPROTT, William, M.Sc., M.B., Ch.B., 210A Queen Street, Onchunga, Auckland, S.E.5. (*Medical Practitioner*). A.'45.
- STACE, Gordon Walter, Dominion Laboratory, D.S.I.R., P.O. Box 2224, Auckland, C.I. (*Senior Scientific Officer*). A.'41;

- STACEY, Donald Louis, B.Sc., N.Z. Forest Products Ltd., Kinleith, P.O. Box 14, Tokoroa. (*Pulp Mill Manager*). A.'45.
- STANLEY, Bernard George, M.Sc., A. C. Hatrick (N.Z.) Ltd., P.O. Box 5, Tawa, Wellington. (*Assistant General Manager (Sales)*). A.'59.
- STANSFIELD, Roger Henry John, 56 Buckland Road, Mt. Roskill, Auckland, S.2. A.'31.
- STAPLES, Kenneth William, B.Sc., N.Z. Forest Products Ltd., Private Bag, Tokoroa. (*Chemist*). A.'57.
- STEDMAN, Brian Maurice, M.Sc., N.Z. Refrigerating Co. Ltd., Islington, Private Bag, Christchurch. (*Assistant Chemist*). A.'49.
- STEWART, Martin Louis Haerpfner, M.Sc., F.R.I.C., Shell Oil (N.Z.) Ltd., P.O. Box 2091, Wellington. (*Manager, Industrial Chemicals Division*). A.'31; F.'39.
- STEWART, Rex George, M.Sc., A.R.I.C., Wool Industries Research Institute, 444 George Street, Dunedin. (*Research Officer*). A.'61.
- STONE, Harry McEwen, M.Sc., C.O.P. Dairy Chemistry and Dairy Bacteriology, Dominion Laboratory, D.S.I.R., Private Bag, Petone. (*Senior Scientific Officer*). A.'52.
- STONYER, Cyril Lester Haste, B.Sc., Tasman Vaccine Laboratory Ltd., P.O. Box 29, Upper Hutt. (*Industrial Chemist, Chemical Products Department*). A.'46.
- STOTT, James Boothroyd, Ph.D.(Leeds), Coal Mining Research Department, University of Otago, Dunedin, N.I. (*Senior Lecturer*). A.'54.
- SUMMERVILLE, Oscar, B.Sc., Solway Products, 23 Patrick St., Auckland, S.E.5. (*Chemist*). A.'59.
- SUTHERLAND, Arthur John, A.M.T.C., Hutt Valley Memorial Technical College, Buick Street, Petone. (*Head of Science Department*). A.'58.
- SUTHERLAND, Graeme John, M.Sc., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Ph.D. Student*). A.'62.
- SUTHERLAND, James Nelson, M.Sc., C.O.P. (Bact. and Clin. Path.), King Edward Technical College, Dunedin. (*Science Master*). A.'40.
- SUURING, Mrs. Dora, Cand. and Doct. Exam.(Amsterdam), A.R.I.C., Onslow College, Johnsonville. (*Science Teacher*). A.'54.
- SWANEY, Alan Harding, B.Sc., A. C. Nottingham & Co. Ltd., P.O. Box 1, Christchurch. (*Chemist*). A.'47.
- SWEDLUND, Bernard Eskil, M.Sc., Ph.D.(Lond.), Chemistry Department, University of Auckland. (*Lecturer*). A.'47.
- SWEETMAN, Brian Jack, M.Sc., Chemistry Department, University of Otago, P.O. Box 56, Dunedin. (*Research Fellow*). A.'61.
- SWINDALE, Leslie Denis, M.Sc., Ph.D.(Wisconsin), N.Z. Pottery and Ceramics Research Association, Private Bag, Lower Hutt. (*Director*). A.'51.
- SYMES, Langford Park, Canterbury Frozen Meat Co. Ltd., Box 2, Belfast, Christchurch. (*Retired, former Chief Chemist*). A.'31; Hon.F.'59.

T

- THOMAS, Alfred John, B.Sc., 21 West Road, Northland, Wellington. A.'46.
- THOMAS, Brian Russell, M.Sc., Ph.D.(Lond.), Dominion Laboratory, Private Bag, Petone. (*Senior Scientific Officer*). A.'61.
- THOMPSON, Frank Burnhope, M.Sc., Rukuhia Soil Research Station, P.O. Box 490, Hamilton. (*Principal Scientific Officer*). A.'33.
- THOMPSON, Mrs. Megan, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Temporarily overseas*). A.'61.
- THOMPSON, Robert Leslie, M.Sc., Mobil Oil (N.Z.) Ltd., P.O. Box 1709, Auckland. (*Sales Chemist*). A.'50.
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U

UNDERHILL, Roger, B.Sc.(Bristol), 109 Greenhill Road, Blackheath, Birmingham, England. A.'53.

V

VAUGHAN, John, M.Sc.(Wales), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch (*Professor of Chemistry*). A.'50; F.'59.

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- WHITE, Edwin Percy, M.Sc., D.Sc., Ruakura Animal Research Station, Private Bag, Hamilton. (*Senior Principal Scientific Officer*). A.'38; F.'61.
- WHITE, Graham Richard, M.Sc., Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Lecturer*). A.'61.
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- WHITE, Stanley Weston, B.Sc., Christchurch Technical College. (*Assistant Science Master*). A.'54.
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- WILKINS, Cuthbert John, M.Sc., Ph.D.(Lond.), D.I.C., Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Reader*). A.'44.
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- WRIGHT, Graeme John, B.Sc.(Hons.), Chemistry Department, University of Canterbury, P.O. Box 1471, Christchurch. (*Lecturer*). A.'62.
- WRIGHT, Graham Allen, M.Sc., D.Phil.(Oxon.), Chemistry Department, University of Auckland, P.O. Box 2175, Auckland. (*Lecturer*). A.'62.
- WRIGHT, Nevill Lushanus, F.R.I.C., D.I.C., P.O. Box 191, Takapuna, Auckland. (*Technical Consultant*). F.'45.
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Y

- YOUNG, Jason Carmel, B.Sc., Dip. Ind. Chem., Kempthorne Prosser Hornby Chemical Works, P.O. Box 5500, Christchurch. (*Works Chemist*). A.'62.

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- COSTER, David Gordon, M.Sc., A.R.I.C., 8 Rochford Place, Christchurch, N.W.I. (*District Manager, Standard Vacuum Oil Co. (N.Z.) Ltd.*)
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- HOOK, Rexford George, B.Sc.(Sydney), A.R.I.C., 23 Bingley Avenue, Epsom, Auckland.
- MINSON, D. J., B.Sc., Ph.D., A.R.I.C., Ruakura Animal Research Station, P.B., Hamilton.
- PROCTOR, B. A., M.Sc., A.R.I.C., Plant Chemistry Division, D.S.I.R., P.B., Palmerston North.
- RAESIDE, James Dickie, M.Sc., A.R.I.C., Soil Bureau, D.S.I.R., P.O. Box 733, Dunedin. (*Pedologist*).
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- TILLER, Mrs. Mavis, B.Sc.(Lond.), A.R.I.C., 7 Thorby Street, Wellington.
- UDY, Ward Howard, B.Sc.(Lond.), A.R.I.C., 8 Union Street, Hamilton. (*Retired, formerly Laboratory Superintendent, N.Z. Co-op Dairy Co. Ltd.*)
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PAPERS READ BEFORE BRANCHES, 1962

AUCKLAND BRANCH

- Some recent advances in X-ray crystallography (*Dr T. N. Waters*).
 Some applications of an electronic digital computer (*Mr R. L. Currie*).
 The mechanism of oxidation of organic compounds (*Dr W. A. Waters, F.R.S.*)
 Cross sections of chemotherapy (*Dr D. Peak*).
 Cancer chemotherapy research (*Dr B. F. Cain*).
 The design of the new Chemistry, Physics and Mathematics buildings of the University of Auckland (*Mr J. R. Blake-Kelly*).
 Sex hormones, real and imitation (*Prof. C. S. Shoppee, F.R.S.*).
 Industrial research around the world, including some impressions in Moscow (*Dr I. W. Wark*).
 Natural radioactivity (*Sir Ernest Marsden, F.R.S.*).

WAIKATO BRANCH

- Meat research abroad (*Dr B. B. Marsb*).
 Autoxidation and its inhibition (*Dr W. A. Waters, F.R.S.*).
 Symposium on DDT residues (*Mr P. J. Gallabery, Mrs Julie Dorofaeff, Mr M. R. Coup*).
 The American nutmeg (*Dr R. Hodges*).
 Recent hydrothermal research (*Dr A. J. Ellis*).
 Sex hormones, real and imitation (*Professor C. W. Shoppee, F.R.S.*).
 Serpentine and superphosphates (*Mr K. F. Hoy*).
 Technician training (*Mr K. Duncan*).

MANAWATU BRANCH

- Potassium chromo-oxalate (*Professor D. R. Llewellyn*).
 The application of isotopes to biological problems (*Dr A. Wilson*).
 The mechanism of oxidation of organic compounds (*Dr W. A. Waters, F.R.S.*).
 Plant oestrogens (*Dr E. Wong*).
 Folic acid metabolism (*Dr R. L. Blakely*).
 "Let's just kick it around" (*Mr R. Hicks*).
 Biosynthesis and significance of the lipids (*Dr F. B. Shorland*).
 Sex hormones, real and imitation (*Professor C. W. Shoppee, F.R.S.*).
 The production and metabolism of propionic acid (*Dr A. T. Johns*).
 Non-enzymic browning (*Dr E. Richards*).

WELLINGTON BRANCH

- Recent advances in the chemistry and physics of wool (*Dr W. S. Simpson*).
 Mechanism of the oxidation of organic compounds (*Dr W. A. Waters, F.R.S.*).
 The future for a chemical industry in New Zealand (*Mr D. A. Watkins*).
 "Lucky Strike" (*Mr J. Vaughan*).
 Hot water (*Dr A. J. Ellis*).
 Current research in the Chemistry Department, V.U.W.—The avidin-biotin complex (*Mr P. D. Jones*); Some sulphites of copper (*Mr D. Morrison*); Heartwood extractives of Tanekaha (*Mr P. O. Whimp*).
 Sex hormones, real and imitation (*Prof. C. W. Shoppee, F.R.S.*).
 Mellor Memorial Lecture: Modern ceramic chemistry (*Dr L. W. Swindale*).

CANTERBURY BRANCH

- Aspects of industrial chemistry in Christchurch (*Messrs. M. Carrie, W. L. M. Dearsley and D. J. Higgins*).
 Light from chemical reactions (*Dr W. S. Metcalf*).
 Oxidation of organic compounds (*Dr W. A. Waters, F.R.S.*).

Relationships between chemical structure and pharmacological activity (Dr G. S. Cox).

The biosynthesis of cholesterol (Dr W. E. Harvey).

"Anomalous" properties of the Ti ion (Dr M. H. Panckhurst).

Lipids and the ruminant (Dr D. E. Wright).

The changing concept of aromaticity (Dr R. D. Topsom).

Ion association and complex formation (Dr J. E. Prue).

OTAGO BRANCH

Mixtures of non-electrolytes (Dr A. G. Williamson).

Local industry (Messrs A. J. D. Robb, F. W. Oxley and H. W. Sandle).

Mechanism of oxidation of organic compounds (Dr W. A. Waters, F.R.S.).

Biosynthesis of cholesterol (Dr W. E. Harvey).

Who's blinded by science? (Dr F. B. Shorland).

Further reflections on educating scientists (Professor H. N. Parton).

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(Elected November 27, 1962)

ALLISON, Russell Morris, M.Sc., Ph.D.(Wis.), Crop Research Division, D.S.I.R., Christchurch (Principal Scientific Officer).

DUNCAN, James Francis, M.A., M.Sc., D.Phil., D.Sc., Chemistry Department, Victoria University of Wellington (Professor).

ELLIS, Albert James, M.Sc., Ph.D., Dominion Laboratory, Lower Hutt, (Senior Principal Scientific Officer).

KENNERLEY, Rowland Alfred, M.Sc., Dominion Laboratory, Lower Hutt (Principal Scientific Officer).

Associates

(Elected November 27, 1962)

ARCUS, Alexander Colvin, M.Sc., Ph.D., Medical Unit, Princess Margaret Hospital, Christchurch (Research Biochemist).

BURNS, Gary Robert, M.Sc., Chemistry Department, Victoria University of Wellington (Junior Lecturer).

EARL, William Brian, B.Sc., B.E.(Chem.)(Hons.), Chemical Engineering Department, University of Canterbury (Asst. Lecturer).

GORDON, Lyndsay George McDonald, B.Sc., Takapuna Grammar School, Auckland (Science Teacher).

LAMBDEN, Alfred Edward, B.Sc., A.R.I.C., Christchurch Drainage Board (Chief Chemist).

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METCALF, Mary Glen, M.Sc., Medical Unit, Princess Margaret Hospital, Christchurch (Biochemist).

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BOOK REVIEWS

ABSORPTION SPECTROSCOPY, by R. P. Bauman, J. Wiley and Sons, New York, 1962. Price 12.00 dollars.

This is an excellent book describing the experimental methods used in ultraviolet and visible absorption, infra-red absorption and Raman spectroscopy as well as giving a very useful and clear account of the theory. Microwave spectroscopy is not covered. The balance between theory and experiment is very good and this would be an admirable text for Stage 3 and Honours students. The author recognizes that a great deal of information may be found from a purely empirical examination of spectra and that a vigorous theoretical treatment while always illuminating is often not necessary to interpret the results obtained. For this reason the book should have a wide appeal to the general reader.

—T.A.T.

SYMPOSIUM ON ELECTRICAL CONDUCTIVITY IN ORGANIC SOLIDS, edited by H. Kallmann and M. Silver. Interscience Publishers, New York, 1961. A Symposium held at Duke University, 1960. 395 pages. Price 12.50 dollars.

This book will probably be of limited interest to members of the Institute since it deals with an aspect of solid state physics. Conjugated organic molecules provide mobile electron systems, which cause the substances to act as semi-conductors. To quote (p. 278) "Typical examples for compounds that possess semi conductive properties can be found in the polycyclic aromatic compounds. Naphthalene and anthracene are electrical insulators with high values of resistivity. As the condensation of aromatic rings proceeds, the resistivity of the compound decreases. Thus for instance pyranthrene with eight rings possesses 10^{10} ohm-cm, and violanthrene with nine rings 10^{14} ohm-cm. Treatment of these compounds with excess sulphur results in new compounds with resistances of 10^3 ohm-cm and 10^2 ohm-cm respectively (p. 286)." Many interesting problems arise from these and other facts which are discussed in other more theoretical papers. This book provides stimulating reading for those interested in subjects on the border between physics and chemistry.

—T.A.T.

ADVANCES IN SPECTROSCOPY, Vol. II, edited by H. W. Thompson. Interscience Publishers, New York, 1962. 483 pages. Price 13 dollars.

This is the second of a series of volumes on spectroscopy intended to "provide periodic authoritative surveys on recent progress in different branches written by experts who have themselves contributed to it."

Only one real criticism can be made and that is that many of the reviews are not as up to date as one could have wished. There has been a long delay (apparently over two years in some cases) between the writing and the publication.

In this volume, the application of atomic absorption spectra to chemical analysis is reviewed by Walsh in an article which will have lasting value in spite of the publication delay as it deals thoroughly with the basic principles. The spectra of flames are discussed by Gaydon in an adequate condensation of his book. Practical aspects of X-ray spectroscopy are fairly well covered (to

1959) by Friedman, although matrix effects and the factors limiting sensitivity could with advantage have been given a more complete treatment. Richards provides a very useful account of nuclear magnetic resonance. A long article by Vedder and Honnig gives an excellent review of the infra-red spectra of crystals, while two shorter papers, one by Jaffe on the refraction of gases in the infra-red and one by Norris on the I.R. spectra of micro-organisms provide useful summaries of work in fields somewhat outside the experience of many spectroscopists. In the ultra violet, Richards deals with the absorption spectra of proteins and related compounds in a very complete review while the final paper is provided by Longuet-Higgins on recent developments in the theory of molecular energy levels.

The book is well produced, the binding, printing and photographs being excellent, and can be thoroughly recommended as a highly desirable, if not essential, addition to any spectroscopic library.

—J.E.A.

ALKYD RESIN TECHNOLOGY: FORMULATING TECHNIQUES AND ALLIED CALCULATIONS, by T. C. Patton. Interscience Publishers, New York. 1962. 194 pages. Price 9.75 dollars.

This manual is the eighth in a series designed as aids for the acquisition of new techniques and for the proper selection of classical and instrumental methods.

Dealing with the quantitative aspect of alkyd resin technology, the author proposes the feasibility of a theoretical calculation of alkyd composition related to a qualitative expectation. The reader is lead logically and in adequate detail through the theoretical design of alkyd composition based on four concepts: (1) the average functionality, F_{av} , of the system; (2) the probability, p , of a branch to branch connection; (3) the specific acid number, AN, at alkyd gel point; (4) the average molecular weight, M_{av} , at alkyd gel point.

The use of average functionality, F_{av} , as a basis for calculation of composition is shown to be straightforward and leads to the proposal of an alkyd constant, K . As the development of an alkyd resin in the past has been very much a trial-adjust-trial process, the adoption of an alkyd constant for composition calculations could mean a considerable reduction in preparatory work and less speculation about the possibility of success.

Chapter 2, dealing with the factors affecting alkyd production, is lamentably weak, although, to some extent, saved by the excellent list of literature references.

The author has provided an interesting manual which should be of considerable value to workers in the resin technology field.

—K.E.F.

INSTITUTE LIBRARY

The Librarian, Mr S. G. Brooker, reports that there has been only one change in the journals received by the Institute's library housed at the Auckland Museum. We no longer receive *Acta Chimica Sinica* but in its place we get *Huaxue Tongbao*—which could be extremely valuable for anyone wishing to learn scientific Chinese.

BOOKS RECEIVED

METHODEN DER ORGANISCHEN CHEMIE, (Houben-Weyl), edited by Eugen Muller. Georg Thieme Verlag, Stuttgart, 1962. 1217 pages. DM 262.

Several parts of the fourth edition of Houben-Weyl have now been received and each part strengthens our high opinion of this monumental work. This latest issue contains two long articles on the preparation of fluorine and chlorine compounds, by E. Forstner and R. Stroh respectively.

CAHIERS DE SYNTHÈSE ORGANIQUE, Vol. 9, (Mathieu-Allais). Masson et Cie, Paris, 1962. 326 pages, 100NF.

Mathieu-Allais deserves to be better known than it is and should be a powerful weapon in the armoury of the synthetic organic chemist. This part deals with the ring closure of simple heterocyclic compounds. The standard of production compares favourably with other French books and the price is reasonable.

LEHRBUCH DER ORGANISCHEN CHEMIE, Vol. 2, (Klage). W. de Gruyter & Co., Berlin, 1962. 639 pages, D.M. 56.

This volume deals with theoretical organic chemistry. Three editions of this part have been called for in eight years, compared with two of Vol. 2 on systematic organic and only one of Vol. 3 on special topics.

—S.G.B.

CORRECTION

The note concerning Mr W. Vose in the Wellington Branch notes in the October issue was incorrect. Mr Vose is still General Manager of the Ceramics Division, Winstone Ltd., through which he is General Manager of Winstone's Roofing Tile Works Ltd. and Managing Director of Huntly Brick Co. Ltd. He was previously Technical Director of the Huntly Brick Co.

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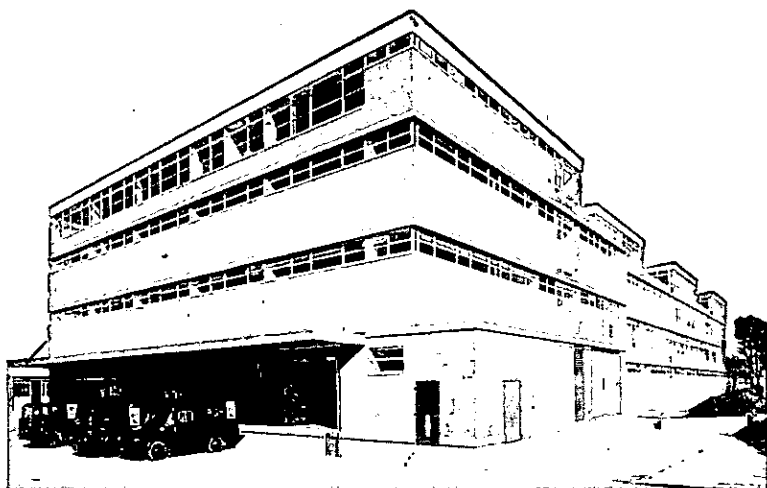
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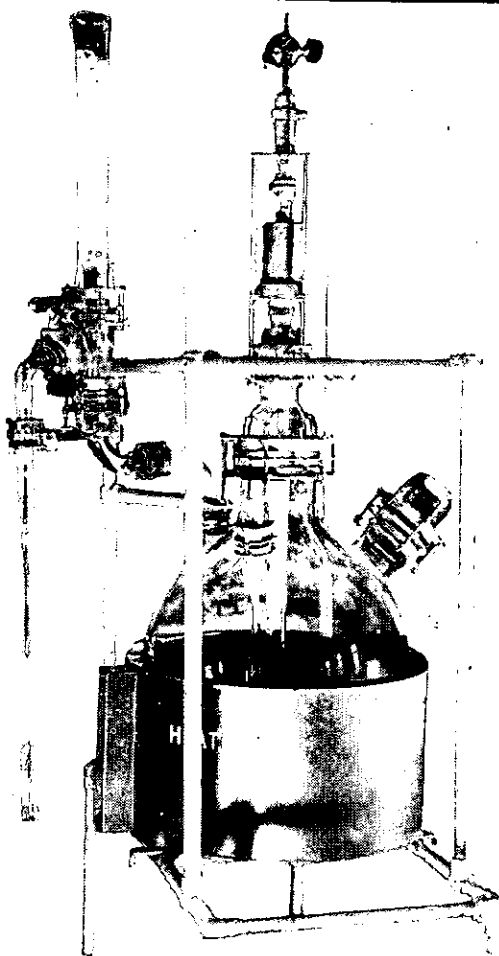
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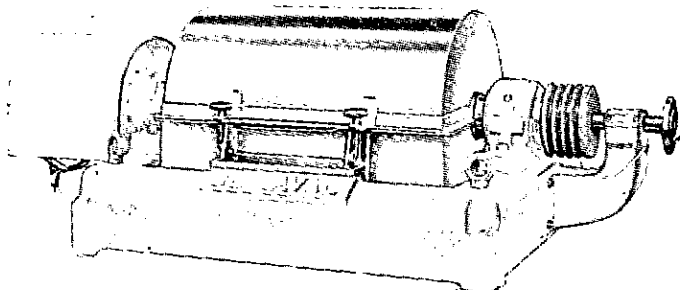
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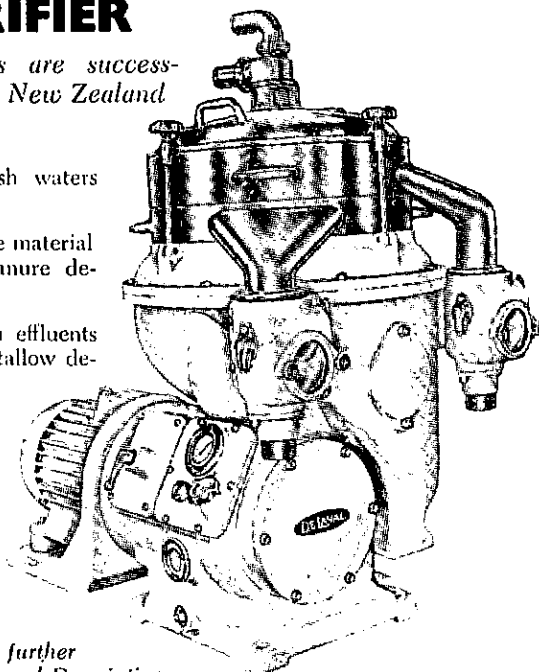
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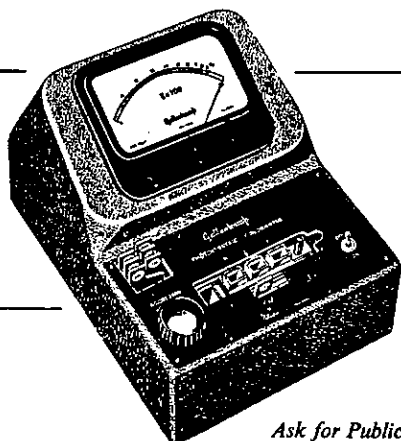
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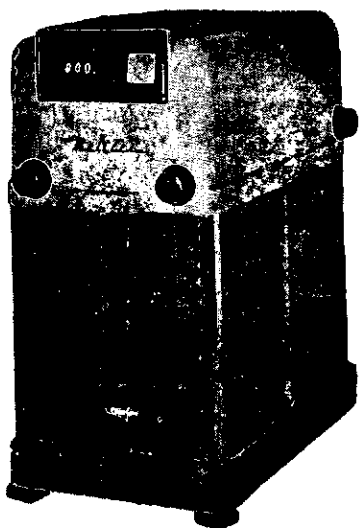
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