

SCHOOL OF GENERAL STUDIES

DEPARTMENT OF GEOLOGY

ANNUAL REPORT FOR 1964

Staff. Professor D.A. Brown was on Sabbatical leave in North America and Europe from April, 1964 until February, 1965. Mr. B.W. Chappell left in November for Sabbatical leave in the U.K. Dr. C.E.B. Conybeare previously of the Bureau of Mineral Resources, joined the staff as Senior Lecturer, in January, and Mr. R.W. Day, previously of the Queensland Geological Survey, as Senior Demonstrator in February. Mr. K.H. Wolf Senior Demonstrator resigned as from September to take up an appointment in Canada.

Enrolments and Examinations. These students were successful in their candidacy for the Ph.D. Degree - D.J. Belford, M.J. Stauffer and N.A. Powell.

<u>Course</u>	<u>Enrolments</u>	<u>Sat for Examination</u>	<u>Pass</u>
Geology I	52	45	37 (2 D., 6 C.)
Geology II	13 (1 part time)	13	12 (1 D., 6 C.)
Geology IIIA	5	5	5 (1 D.)
Geology IIIB	3 (1 part time)	3	3 (2 C.)
M.Sc.	8	2 submitted successful theses	
Ph.D.	11 (incl. 4 staff)	2 submitted successful theses.	

Mr. J.I. Raine was awarded the Geological Society of Australia Prize, and Mr. M.J. Carr the W.B. Clarke Prize.

Teaching. This was the first year of the IIIB course which is obviously meeting a significant need. Specialist courses in the various branches of the subject have been offered as optional units in addition to a basic core course. For the first time full units in Petroleum Geology, Advanced Economic Geology and Structural Geology have been available, and other subjects such as Petrogenesis, World Stratigraphy and Micropalaeontology have been expanded into full courses.

The facilities available in the new building, which was occupied in October 1963, have enabled us to make far more satisfactory use of our teaching resources. Students have been able to occupy the laboratories as required and the research workers have worked more comfortably and continuously. This more liberal use of facilities is reflected in the examination results and in the improved attitude of the students, as well as in the more varied and intensive research programme outlined below.

Research - Staff

1. The text of a book "The Geological Evolution of Australia and New Zealand" has been almost completed (Brown, Campbell and Crook).

2. A study of the skull of the lungfish Dipnorhynchus süssmilchi (Etheridge) has been prepared for publication, and the brachiopods and conodonts of the Murrumbidgee Limestones have been examined (Campbell).

3. A piece of research on the Athabasca Tar Sands has been completed and accepted for publication (Conybeare).

4. A chemical study of migmatites and granites from the Eastern Mt. Lofty Ranges of South Australia, and a petrological examination of an Eclogite-like inclusion from a New South Wales breccia pipe, have been undertaken (White).

5. Sedimentological study of the Stairway Sandstone (with P.J. Cook) has continued with a view to the elucidation of the origin of the phosphate deposits. Further work has been carried out on the Silverdale Fan, Lake George. Preliminary research for studies of the principles of stratigraphic nomenclature, and the relation between climate and sedimentation, has been initiated (Crook).

6. Geochemical research on lead - zinc ore bodies at Zeehan, Tasmania, has been continued. A technique for electron probe microanalysis of sphalerites has been developed in connexion with the above project. The technique of atomic absorption spectroscopy has been successfully adapted to trace element studies of base metal sulphides (Williams).

7. A memoir on the geology of Vanua Levu, Fiji, was completed. Work on the isotopic dating of structural phases in the Appalachians of Canada was sent to press along with a criticism of recent work in this field (Rickard).

8. A new X-ray Spectroscopic method for the chemical analysis (including trace elements) of rocks and minerals has been developed and applied to a study of granitic rocks in New England. A chemical study of Iceland basalts has been undertaken with Dr. K.S. Heier (Chappell).

9. A study of the finely preserved molluscan faunas of the Lower Cretaceous of the Artesian Basin, in conjunction with the Bureau of Mineral Resources survey has begun (Day).

10. The granites of the Strathbogie area, Victoria, are being examined petrologically (Taylor).

11. Several papers were prepared, and accepted for publication, on the nature of algal carbonate deposits in the Devonian of New South Wales (Wolf).

Students

1. The Structural Geology and Petrology of areas around Canberra (Stauffer, Wilson, Smith and Johnson).
2. Sedimentary Properties of Sand (Moss).
3. Silurian Brachiopods from Yass (Kemczys).
4. Significance of Trace Elements in Base Metal Sulphides in S.E. New South Wales (Harris).
5. Petrogenesis of Alkaline Volcanic Rocks in Nandewar Mts. (Abbott).
6. Geology of the Eden area (Steiner).
7. Polyzoa from the New Zealand Region (Powell).
8. Petrogenesis of Tertiary Volcanics near Springsure, Queensland (Mollan).
9. Upper Palaeozoic Ostracoda from the Bonaparte Gulf Basin (Jones).
10. Chemical, optical and X-ray study of Alkali Feldspars from Australian Granites (Rhodes).
11. Permian and Triassic Geology of the Blenheim area, Bowen Basin (Jensen).

Other Activities

Many of the meetings of Section C of ANZAAS were held in the Department. Drs. White, Conybeare and Rickard and Mr. Chappell read papers.

Professor F.H.T. Rhodes of the University College, Swansea, visited the Department for two weeks in April, and delivered several stimulating lectures.

Professor H.A.K. Charlesworth, University of Alberta, has spent six months of his sabbatical leave in the Department, and has stimulated work in Structural Geology.

Dr. N. Bogdanov, of the University of Moscow, has paid several short visits and has held discussions with several members of staff.

Dr. C.E.B. Conybeare delivered a paper at the Annual Conference of the Australian Petroleum Exploration Association in March.

Dr. Crook visited the Amadeus Basin in August in the company of Bureau of Mineral Resources geologists, in order to undertake field work on the Stairway Sandstone.

Mr. Williams and Mr. Chappell attended a conference on X-ray spectroscopy in Sydney in August.

The Students Geological Society has been active and has had several lectures and excursions during the year.

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List of Academic Publications Sept. 1963 - Sept. 1964DEPARTMENT OF GEOLOGY

BROWN, D.A.

'Fossil Bryozoa from Drill Holes at Eniwetok Atoll.' U.S. Geol. Surv. Prof. Pap., 260EE, 1113-1116, 1964.

CAMPBELL, K.S.W., ROBERTS, J.[‡]

'Two species of Delepineia from the Carboniferous of New South Wales.' Paleont., 7, (3), 514-524, 1964.

CONYBEARE, C.E.B.

'Geological interpretation and preservation of oilwell cores.' Aust. Pet. Expl. Assn. Jour., 25-31, 1964.

'Oil accumulation in alluvial stratigraphic traps.' Aust. Oil and Gas Jour., 10, 44-48, 1964.

CROOK, K.A.W.

'Burial metamorphic rocks from Fiji.' N.Z. Jour. Geol. Geophys., 6, 681-704, 1963.

'Depositional environments and provenance of Devonian and Carboniferous sediments in the Tamworth Trough, N.S.W.' J. Proc. Roy. Soc. N.S.W., 97, 41-53, 1964.

'Cleavage in weakly deformed mudstones.' Am. Jour. Sci., 262, 523-531, 1964.

IRVING, E.^Ø, BROWN, D.A.

'Abundance and diversity of Labyrinthodonts as a function of palaeolatitude.' Am. J. Sci., 262, 689-708, 1964.

LOVERING, J.F.^Ø, WHITE, A.J.R.

'The significance of primary scapolite in granulitic inclusions from deep-seated pipes.' J. Petrol., 5, 195-218, 1964.

RICKARD, M.J.

**'Contact metamorphism in relation to manner of emplacement of the granites of Donegal, Ireland - a discussion.' J. Geol., 72, (5), 682-684, 1964.

'Minimum age of Middle Ordovician rocks in Southern Quebec - discussion; and discussion of reply.' Bull. Geol. Soc. Amer., 75, 909-913, 1964.

'Metamorphic tourmaline overgrowths in the Oak Hill Series of Southern Quebec.' Canadian Mineralogist, 8, 1, 86-91, 1964.

**'Geology of Ndrua Ndrua Area, Vanua Levu. Sheet 1. 1/50,000 scale Geological Map.' Geol. Surv. Fiji, 1964.

**'Geology of Undu Peninsula, Vanua Levu. Sheet 2. 1/50,000 scale Geological Map.' Geol. Surv. Fiji, 1964.

STAUFFER, M.R.

'The geometry of conical folds.' N.Z. Jour. Geol. Geophys., 7, 340-347, 1964.

VOISEY, A.H.[‡], WILLIAMS, K.L.

'The geology of the Carroll-Keepit-Rangari area of New South Wales.' J. Proc. Roy. Soc. N.S.W., 97, 65-72, 1964.

WEBB, J.S.[‡], BAKER, M.D.[‡], RICKARD, M.J.^{**}

'Geochemical anomalies in the coastal environment of Vanua Levu, Fiji.' Mining Mag., 109, 329-336, 1963.

WHITE, A.J.R.

'Stilpnomelane in the Brisbane Metamorphics.' Aust. J.Sci., 26, 324, 1964.

'Clinopyroxenes from eclogites and basic granulites.' Amer. Mineral., 49, 883-888, 1964.

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