fortunately, well preserved, and bears a resemblance to the *Harpactocarcinus* figured by H. Woodward in the Quarterly Journal of the Geological Society (xxii., 51), but it is not that genus.

Crassatella australis was plentiful, *Trochus chathamensis*, and a number of corals. A few fragments of leaves were found, and the vertebra of a fish having a centrum 1 in. in diameter.

SECTION ACROSS WAITAKI RIVER THREE-QUARTERS OF A MILE BELOW THE JUNCTION OF THE WHAREKURI CREEK.

a. Recent river gravels.
b. Terrace gravels and silts, with moa-bones.
c. Sandy shell beds full of fossils.
d Dark-green sandy beds.

Following down the bed of the river, the section exposed for a mile or two is a cliff of about 20 ft. of fine sandy material full of the most delicate and beautiful specimens of fossils — huge specimens of *Dentalium giganteum*, brachiopods of several species, *Natica*, *Turritella*, *Limopsis*, *Lima*, and a number of small species. A very fine collection could be made here by careful search. The conditions under which the beds were deposited seem to have been very favourable to the development of all forms of animal life in land-locked shallow seas with a mild climate.

EXPLANATION OF PLATES XXXVII. AND XXXVIII.

PLATE XXXVII.

Aturia ziczac.

PLATE XXVIII.

Section of *Aturia ziczac.*

ART. XXXVII.—*Boulders in Triassic Conglomerate, Nelson.*

By Dr. P. MARSHALL, Lecturer in Geology, Otago School of Mines.

[*Read before the Otago Institute, 9th June, 1903.*]

Plates XXXIX.–XLI.

THE following descriptions of rock-sections are given in the hope that they may help in forming an accurate idea of the age of many of the igneous rocks occurring in the older formations of the Nelson Province. In many cases the age of

igneous rocks can be most readily settled by recording their occurrence or absence as rolled fragments in fossiliferous sediments. In the present case it is evident that the parent masses from which these conglomerate fragments were derived must be older than the Triassic period. The collection was made by Professor Park from the conglomerates occurring at the base of the Triassic formation in Nelson.

C 275.—Granite. Dark-grey on weathered surface. Mica plates distinct; feldspar opaque. Stained with iron-oxide.

Section: Quartz rather plentiful, with very irregular outlines. Water clear, with undulose extinction. Feldspar partly orthoclase, twinned on the Carlsbad law; also in rather greater abundance an albite-oligoclase with extinction angle of 8°. Albite twinning general. Carlsbad less common. Zonal structure general, showing progressively lower extinction angles towards the margin. Decomposition producing cloudy appearance in centre of crystals, due to development of very minute epidote crystals and other substances too fine-grained for recognition. Hornblende in idiomorphic crystals rare, with pleochroism from dark-green to pale-yellow. Biotite more frequent, dark-green or pale-yellow, rather decomposed to a viridite substance. Sphene not abundant, granular. Very pale-grey. Slightly pleochroic.

C 276.—Granite. Fine-grained, light-pink. Biotite plates fairly large.

Quartz plentiful, perfectly clear, without undulose extinction. Feldspar chiefly microperthite, in places forming a graphitic intergrowth with quartz. Albite sometimes forming cores for microperthite. All feldspar rather decomposed and cloudy. Decomposition products very fine. Occasional small flakes of brownish-green mica. Small idiomorphic sphene, and magnetite in very small quantity.

C 277.—Granite. Pink, coarse-grained, with fairly large biotite plates. Quartz white. Feldspar pink.

Quartz abundant, perfectly clear, granular. Feldspar porphyritic, the larger crystals being orthoclase or albite. Much decomposed into epidote and muscovite. On the margins of larger grains of quartz and feldspar a granular intergrowth, the nearer portions of mineral matter similar optically to the crystals; has similar orientation with them. Otherwise the structure is microgranitic. A little brownish-green biotite, magnetite, and two or three minute crystals of zircon. No sphene visible in the section.

C 278.—Granite. White, coarse-grained. Quartz white. Biotite plates not present. Feldspar white.

Quartz clear, in large grains, on the exterior of which there is often an intergrowth of feldspar. Feldspar chiefly orthoclase, rather decomposed, much intergrown with quartz, even in the interior of large crystals. Cloudy with minute decomposition products. No ferro-magnesian minerals. A few irregular grains of sphene, showing distinct pleochroism.

C 279.—Granite. Dull-pink. Porphyritic quartz. Biotite small.

Section generally similar to C 277, but quartz rather coarser. In places microgranitic structure, but generally micrographic. Brown biotite more abundant than in C 277, and magnetite much pierced by crystals of apatite. No sphene or zircon visible.

C 280.—Granite. Large white crystals of porphyritic feldspar in pink fine-grained base.

Section similar to C 275, but coarse-grained. Feldspar includes orthoclase, albite, and microperthite twinned in the usual way. Large flakes of brown biotite with apatite needles. No hornblende. A little magnetite and sphene.

C 281.—Diorite. Dark hornblende in irregular crystals. Grey feldspar.

Feldspar crystals allotriomorphic, showing twinning on albite and occasionally on pericline laws. Extinction angle 30°, indicating an acid labradorite. Much decomposed into comparatively large crystals of epidote, muscovite, quartz, and "garnet." Hornblende plentiful in light-green crystals pleochroic from green to pale-yellow, occasionally twinned. Much intruded by various inclusions for the most part originally feldspar and apatite. Now decomposed like the surrounding feldspar. No magnetite or other accessory minerals.

C 282.—Porphyry. Feldspar phenocrysts green. Base greyish-brown.

Phenocrysts of orthoclase idiomorphic, twinned on Carlsbad law; much decomposed, apparently into sericite. Smaller phenocrysts of epidote, but crystals not optically single, but aggregates. Form similar to hornblende, from which the mineral is derived. Base rather coarsely felsitic, but no trace of original microlites, so probably originally a glass. Felsitic matter apparently composed of feldspar and a decomposed ferro-magnesian mineral. Magnetite in fairly large grains not infrequent.

C 283.—Porphyrite. Feldspar opaque, green. Base dark-brown.

Feldspar phenocrysts much decomposed, but Carlsbad twinning still faintly seen. Decomposition products mostly chlorite, epidote, and apparently muscovite, finely divided. Brown mica fairly abundant. Groundmass glassy, with black microlites decomposed into opaque ferritic matter. Flow-structure distinct. Idiomorphic crystals of magnetite fairly abundant. In some cases pierced by apatite needles.

C 284.—Uralite porphyrite. Feldspar opaque; white, small, sharp crystals. Base nearly black.

Augite phenocrysts fairly large, partially changed into green fibrous pleochroic hornblende. Colourless when unchanged. Feldspar in two generations: Sharply idiomorphic with short forms, sometimes isometric; decomposition rather advanced towards the centre of the crystals; maximum extinction angle 30°; second generation similar in all details except size to first generation. No slender microlites. Feldspar imbedded in granular green hornblende evidently derived from augite. Magnetite very abundant.

C 285.—Porphyry. Feldspar generally glassy, with bright cleavage surfaces. Base dark-brown.

Feldspar in sharp phenocrysts, sometimes much weathered, but more often quite clear. Twinned on Carlsbad law, and perhaps occasionally on Baven's, but examples not good. Occasionally albite lamellation, indicating a plagioclase near oligoclase. Base for the most part glassy, but secondary devitrification not uncommon; many decomposed microlites changed into a ferritic substance. Chloritic pseudomorphs rather frequent. The original mineral usually hornblende, sometimes biotite. Epidote with chlorite. Secondary quartz in knots not infrequent. Angular inclusions of a shaly rock with carbonaceous matter frequent.

C 286.—Porphyry. Feldspar opaque, greenish. Base dark-brown.

Feldspar mostly orthoclase, sometimes zoned, when the exterior border gives straighter extinction than the core. Decomposition into a dusty substance (sericite) general, especially in the central portions. Flakes and needles of a bright-green chlorite also frequent. Much chlorite in cleavage cracks. Some plagioclase, with well-developed albite twinning apparently oligoclase. Pseudomorphs of chlorite after hornblende rather common. Base glassy, with well-developed

damascened structure. Magnetite grains fairly large, pierced by apatite needles.

No rocks occurring *in situ* similar to these have hitherto been recorded from the Nelson District. It is hoped that when the geology of the province is studied with the aid of petrographical investigations these descriptions will be of some value in determining the age of some of the igneous rocks.

ART. XXXVIII. — *Second Supplement to the "Materials for a Bibliography of the* Dinornithidæ."

By A HAMILTON.

[*Read before the Otago Institute, 3rd December, 1903.*]

TEN years ago I presented to this Institute the first portion of the working-list of papers on the moa, and the subsequent year a small first supplement of items which had been accidentally omitted, for several of which I was indebted to the kindness of friends. This evening I submit another supplementary list, bringing the material for the bibliography up to date.

As in the previous lists, some papers are included which treat of the smaller extinct birds, the history of which is bound up with that of their giant relatives, the moas.

Author	Title of Paper.	Name, &c., of Publication.
Andrews, C. ..	On the Extinct Birds of the Chatham Islands. Part I.: The Osteology of *Diaphorapteryx hawkinsi*	Nov. Zool. iii. 73, pl. iii.; 1896.
	On the Extinct Birds of the Chatham Islands. Part II.: The Osteology of *Palæolimnas chathamensis* and *Nesolimnas* (n. gen.) *dieffenbachi*	Nov. Zool. iii. 260, pl. ix. and x.; 1896.
	Note on a Skeleton of *Diaphorapteryx hawkinsi*, Forbes, a Large Extinct Rail from the Chatham Islands	Geol. Mag. (Dec. iv.) iii. pl. xii.; 1896.
	Note on a Nearly Complete Skeleton of *Aptornis defosser*, Owen	Geol. Mag. (Dec. iv.) iii. pl. x.; 1896.
Benham, W. B. ..	Notes on the Fourth Skin of *Notornis*	Trans. xxxi. 146; 1897.