

The author described an analysis of the fine grained quartz-dolerite at Hound Point. In this rock the ferro-magnesian minerals have been replaced by carbonates of lime and iron, while the felspars have remained fresh. It was pointed out that the intrusion of dolerite into the sandstones at Hound Point was accomplished in two stages.

Chemical analyses and microsections of the quartz-dolerites and segregation veins at Hound Point, Ferrytoll Quarry at North Queensferry, and Prestonhill Quarry, near Inverkeithing, were shown and discussed. The analyses, in each case, were made: (1) of the quartz-dolerite of the quarry, (2) of the quartz-dolerite within one inch of the segregation vein, and (3) of the segregation vein itself.

3. "The Problem of the Quartz-Dolerites." By Dr. Frederick Walker, F.R.S.E., and Miss M. F. Alexander, M.A., University of St. Andrews. Illustrated by lantern slides.

Chemical analyses make it possible to distinguish between quartz-dolerites of Lower Devonian, Permo-Carboniferous, and Tertiary ages. They also provide valuable clues as to the mode of origin of all three suites, although the exact age and affinities of the second-named suite still remain unsettled. It is hoped by further detailed chemical and petrographical investigation to throw more light on these points, as the field evidence is apparently unsatisfactory.

4. "Bombs of Nepheline-Basanite in the Partan Craig Vent, East Lothian." By T. Cuthbert Day, F.C.S., F.R.S.E., and E. B. Bailey, M.C., B.A., F.G.S.

In the *Trans. Geol. Soc. Edin.*, vol. xi, p. 344, it is pointed out that abundant and easily recognizable fragments of a greenish-grey decomposed igneous rock are restricted to the Partan Craig Vent. Microscopic examination proves the rock to be a nepheline-basanite that has undergone pneumatolysis through the action of comparatively dry carbon dioxide. Its olivine and augite are completely replaced by carbonates, with very subordinate serpentine; while half its nepheline and most of its felspar (oligoclase, albite, and probably orthoclase) remain fresh.

5. "On a Dolerite Dyke in the Rubislaw Quarry, Aberdeen." By F. McLeod Glennie, M.A., B.Sc., University of Aberdeen.

The dolerite is exceptionally rich in biotite and contains inclusions of granite carrying sillimanite.

## OBITUARY.

### Benjamin Neeve Peach.

BORN 6TH SEPTEMBER, 1842.

DIED 29TH JANUARY, 1926.

(PLATE XVIII.)

Charles W. Peach, of the Coast Guard Service, was transferred in 1849 from Cornwall to Scotland. Wherever he went, this born naturalist found fossils. Thus, in the South, he furnished clues to many a stratigraphical puzzle. In the North, in 1854, he proved

the Durness Limestone fossiliferous. Murchison in gratitude arranged for the education of Charles Peach's youngest son at the Royal School of Mines, from which he passed in January, 1862, on to the Geological Survey. The influence of the father's fossil find did not end here. It was Charles Peach's fossils from Durness that set in train the North-West Highland controversy, in the closing of which some thirty years later B. N. Peach took a foremost place—to the lasting honour of himself and of British Science.

Young Peach's first official task was to assist Salter in the determination of fossils in the London office. In later years he often returned to this side of geology, and his descriptions of arthropods of diverse kinds, from highly specialized eoscorpions to shrimp-like schizopods, would in themselves suffice to establish a reputation; but, pre-eminently, Peach was a field geologist, and in this capacity he very soon came back to Scotland, where he was set to map glacial deposits.

At the start, it was the field, and not the geology, that attracted Peach; but soon the delight of discovery caught hold of him as he traced Highland erratics across the Lammermuirs. He had won his spurs, and from this time onwards was regarded as a worthy junior in the small group of distinguished geologists to whom we owe the wonderful primary survey of the rocks and glaciation of the Central Valley.

In 1867, Peach was entrusted with the training of a new recruit, John Horne. Thus began a partnership that lasted almost three score years, and has been the most beautiful and the most fruitful in the history of our Science—and of such a breadth that it allowed of differences of opinion on matters of first-class importance.

A few outstanding successes won by these Investigator Twins, as Heim has called them, may be enumerated, along with dates of publication: Caithness, Orkney, and Shetland glaciated from the South-East (1879–81); the North-West Highlands rendered, to quote Suess' word, transparent (1884, 1888, 1907); the whole Southern Uplands revised on Lapworthian lines, with discovery of radiolarian cherts, overlying Arenig lavas of hitherto unsuspected extension (1892, 1899); the Scottish Carboniferous reviewed (1903); Scottish lakes and rivers referred to their origins (1910).

The North-West Highlands supplied the greatest triumph. Thrusts were already in the air, when, in 1883, Peach and Horne began their work. In that year Callaway published an account of an "overthrow" locally "more than a mile in width", and Lapworth, whose health broke down in the glorious excitement, produced his "Secret of the Highlands". Still, plenty remained to satisfy the most exacting claims as regards originality. The result has been a rendering worthy of the subject. Pilgrims from all countries visit the famous Moine and Glen Coul Thrusts, and they take Peach and Horne's descriptions as their guide. In passing, it may be pointed out that the revelations of the eighties at last



DR. B. N. PEACH (RIGHT) AND DR. J. HORNE (LEFT) IN THE NORTH-WEST HIGHLANDS 1919  
*Photo, S. H. Reynolds.*

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reconciled the *superposition* of Murchison (and Geikie) with the *dislocation* of Nicol. The latter's own opinion had been that "a comparatively very small amount of inversion and extension of older crystalline masses will suffice to explain any of the Scottish sections".

Peach was closely associated with another great Scottish geologist in the person of Archibald Geikie, who chose him as friend and counsellor in Caithness, Orkney, and Shetland, North and South Wales, and the North of Ireland. These trips were very much to Peach's heart, for they introduced him to new problems and troubled him little with cares of publication.

In addition, Peach was the companion of all; and his wide knowledge and lively imagination were pooled in the common interest. His generosity and hospitality in science and at home were proverbial.

Of noteworthy contributions to Scottish geology, not already mentioned, we may cite: The Arran vent with its foundered Mesozoic masses (1901); the twin vents of Arthur's Seat (1911); the Lower Palaeozoic age of the Highland Border rocks (*see* G. Barrow, 1901; R. Campbell, 1911, 1913); the pre-movement hornfels round the Inchbae granite-gneiss (1901, *see* C. B. Crampton, 1912); the Tayvallich schistose volcanics (1904, 1911); the glacial drainage channels of the East Highlands (1905, 1923). Other suggestions that are still under trial include: The Torridonian age of the Moines; the Lewisian inliers in the Moines; the post-Cambrian date of the Highland metamorphism.

It is essential to realize how often Peach owed his inspiration to his skill in the finding and interpretation of fossils. This vitalized his general stratigraphical outlook, and came to the front more especially in the discovery of Southern Upland radiolaria, Arran Mesozoics, and Highland Border radiolaria, brachiopods, and crustacea.

Peach was a man of striking personality. Again and again he has been compared with a lion or an eagle. This was in part due to his handsome head and his great vigour and personal strength, and in part to his searching glance that seemed to penetrate at once to the heart of a problem and to suggest an immediate line of attack. In conversation, he was a master. He would defend a position with an emphasis that was apt, indeed, to be mistaken for dogmatism; but at the same time, there was no one more ready to reconsider a cherished conviction in the light of new evidence. Extraordinary as it may seem, considering his dominating position in Scottish geological thought, he trusted almost wholly to conversation for his intercourse with the scientific world. He could scarcely bring himself to write or to read. It is curious too that the power and confidence, so abundantly expressed in conversation, forsook him when he was called upon to speak in public—except in the open, where he excelled as leader of excursions, and also on the

happy occasion of his presidency over Section C at the Dundee meeting of the B.A., 1912, when he surprised and delighted all his friends. Peach was himself, too, whenever he handled a pencil, and will long be remembered for graphic sections across mountain chains, portraits of fossils, and maps, alike beautiful and true.

It is characteristic of his great boyish spirit that his thoughts never rested on achievement, but were ever concentrated on problems of the present and the future, some of them important, some trivial. He received the Wollaston Fund, Murchison Medal, and Wollaston Medal, as well as the 1892 Murchison Centenary Prize, from the Geological Society of London, and the Neill Medal from the Royal Society of Edinburgh. He was elected F.R.S. in 1892, and made LL.D. of Edinburgh University in 1903.

E. B. BAILEY.

## CORRESPONDENCE.

### THE SUDBURY NICKEL ORES.

SIR,—Professor Coleman's invaluable map and memoir of the Sudbury district have been of such great service to all students of that instructive mining field that his restatement of the hypothesis that its ores were formed by segregation in the molten norite—published in the last number of this Journal (1926, pp. 108–112) in criticism of my brief summary of the arguments against that view (“The Physical Chemistry of Igneous Rock Formation”, *Trans. Faraday Soc.*, No. 60, vol. xx, part 3, 1925, pp. 454–6)—will carry great weight. He supports the formation of the ores by igneous segregation on the following grounds.

(1) That those who have mapped the area unanimously adopt that theory. So far as I know the literature the hypothesis has been rejected in recent years by a great majority of those who have done extensive field work in the locality.

(2) The main support is now attached to the pyrrhotite in the norite which Professor Coleman claims can only be explained as a magmatic segregation. As evidence he instances the Frood Mine of which the petrography has been described by Dr. Howe (*Econ. Geol.*, vol. ix, 1914, pp. 508–14) and the structure by Miller and Knight in their Report to the Ontario Nickel Commission (1917, pp. 196–201 and 218). These and other accounts show that so far from the pyrrhotite there being a primary constituent of norite, it occurs as a secondary material in a belt of fractured rocks of various kinds. According to Howe the ore is partly mineralized diorite and partly mineralized gabbro; Miller and Knight add that it is partly also mineralized quartzite and gray-wacke. The country rock at the Frood Mine has been fractured and the sulphides act as a cement to the fragments, both in the gabbro and diorite, though in the latter the sulphides are also