almost equal dimensions together with the same microscopic texture in oblique sections as given in WILCKENS' figure have led to this conclusion [5]).

It is to be hoped that future investigations will provide more and better preserved fossil remains, especially of the crinoids.

In his synopsis on the pretertiary history of the Malay Archipelago UMBGROVE has given a review of the deposits of Triassic age found in many islands and occurring in a number of different facies, while he also mentions the probable occurrence of Triassic sediments in the islands of Bangka and Billiton [6]).

In Northern Sumatra, in the highlands of Padang, North of Lake Singkarah, an important section with Upper Triassic fossiliferous deposits was found by MUSPER [7]). But also in other parts of Sumatra clay-shales and sandstones with *Halobia* and *Monotis salinaria* have been found, indicating Carnian and Norian ages.

SCRIVENOR [8]) mentions the occurrence of Upper Triassic fossiliferous shales, quartzites, and sandstones in Malacca. In the neighbouring Riau-Archipelago *Halobia*-bearing shales were found by BOTHÉ [9]), whilst MARTIN determined *Daonella* in brown-grey shales from the shore between Laboean Dadong and Sei. Keloemoe, Island of Lingga [10]), and ROGGEVEEN described *Protocupressinoxylon malayense*, a probably Triassic conifer, from the island of Soegi [11]).

Bandoeng, Dienst van de Mijnbouw.

---

5) O. WILCKENS, see footnote 4.

6) J. H. F. UMBGROVE, De pretertiaire historie van den Indischen Archipel. Leidsche Geol. Med. 7, 125, 128—134 (1935).

7) K. A. F. R. MUSPER, Beknopt verslag over de uitkomsten van nieuwe geologische onderzoekingen in de Padangsche Bovenlanden. Jaarb. Mijnw. Ned. Oost-Indië, Verh., 58, 265—329 (1929).

8) J. B. SCRIVENOR, The geology of Malaya (1931).

9) A. CHR. D. BOTHÉ, Het voorkomen van tinerts in den Riau-Archipel en op de eilandengroep van Poelau Toedjoe (Anambas- en Natoena-eilanden). Verslagen en Mededeelingen betreffende Indische delfstoffen en hare toepassingen, 18, 5 (1925).

10) A. CHR. D. BOTHÉ, Geologische verkenningen in den Riouw-Lingga Archipel en de eilandengroep der Poelau Toedjoeh (Anambas- en Natoena-eilanden). Jaarb. Mijnw. Ned. Oost-Indië 54, Verh. II, 98, 143 (1925).

11) P. M. ROGGEVEEN, Mesozoisches Koniferenholz (Protocupressinoxylon malayense n.s.) von der Insel Soegi im Riouw-Archipel, Niederländisch Ost Indien. Proc. Kon. Akad. v. Wetensch., Amsterdam, 35, 580—584 (1932).

Petrology. — *Anorthoclase-bearing granogabbroid to granonoritic rocks from Boeloengan (Eastern Borneo).* By W. P. DE ROEVER and A. KRAËFF. (Communicated by Prof. H. A. BROUWER.)

(Communicated at the meeting of November 29, 1947.)

In the years 1924 and 1931 several rock-samples of granogabbroid affinities have been collected by Ir. A. HARTING and Ir. J. G. H. UBAGHS in the vicinity of the confluence of the S. Kajan and the S. Bahau. Some of these rocks have been found as veins in a dynamometamorphic formation of slates, phyllitic slates, arkoses, and sandstones, which will be described in a later paper. Most of the samples, however, have been taken from boulders, some of which are idolized by the natives.

Two of the samples, H 120 and H 123 — both found as boulders in the S. Kajan, at a distance of ± 9 and ± 16 km, respectively, above the confluence with the S. Bahau — are fresher and less fine-crystalline than the others, and are adapted for a more detailed microscopic study of this comparatively rare rock-type.

The sample H 120 is medium-grained and of a brown-grey colour; the largest crystals of pyroxene are 5 mm in length. The other sample (H 123) shows a porphyritic development owing to the presence of many larger crystals of pyroxene — with sizes of up to 1 cm — amidst a finer crystalline mesostasis.

Under the microscope the main constituents of these rocks appear to be plagioclase, augite, hypersthene, quartz, and anorthoclase, with subordinate or accessory biotite, amphibole, ilmenite, and apatite. Volumetric analyses of one ordinary size thin section of each of these rocks gave the following results:

	H 120	H 123
Plagioclase	43 %	49 %
Augite	19 %	9 %
Hypersthene	15 %	10 %
Quartz	10 %	16 %
Anorthoclase	10 %	14 %
Other constituents	3 %	2 %

Under the microscope both rocks appear to show a rather feebly developed porphyritic structure owing to the presence of larger crystals of pyroxene, especially of augite. The crystals of plagioclase may reach sizes of 2 mm. The anorthoclase and quartz are often in granophyric intergrowth; these minerals are found in the interstices between the crystals of the other constituents, with maximal crystal-sizes of slightly more than 1 mm (anorthoclase) and 2 mm (quartz). The anorthoclase is generally in subhedral to anhedral crystals.

The crystals of plagioclase generally show large cores of bytownite and lime-rich labradorite with recurrent zones; there are rather narrow rims of andesine. The average anorthite content is clearly more than 50 %.

The augite and hypersthene are rather slightly altered. The augite is twinned on (100); a minute striation according to the basal plane combined with this orthopinacoidal twinning produces the characteristic "herring-bone" appearance.

The anorthoclase has a well-developed murchisonite cleavage. The refractive indices are distinctly lower than that of the Canada balsam. This alkalifelspar shows decidedly oblique extinctions in sections perpendicular to n_β and n_γ. For the optic axial angle $2V_\alpha$ of the anorthoclase in the rock H 123 values of $\pm$ 35° were obtained with the aid of the universal rotation stage. In the other rock (H 120) the anorthoclase shows a zonary variation of the optic axial angle $2V_\alpha$ from $\pm$ 40° in the cores to $\pm$ 30° in the rims.

Red-brown biotite is of subordinate importance. A very small amount of original light greenish amphibole may also be mentioned.

According to the quantitative mineralogical classification of JOHANNSEN these rocks could be named anorthoclase-granogabbro-porphyry to -granonorite-porphyry.

Bandoeng, Dienst van de Mijnbouw.

Botany. — *Researches on plant growth regulators.* XIII. *Leaf growth factors.* II. By W. KRUYT and H. VELDSTRA. (Communicated by Prof. V. J. KONINGSBERGER.)

(Communicated at the meeting of September 27, 1947.)

4. *Experiment with Cosmos bipinnatus Cav. "Sensation Innocence" at Boskoop.*

BONNER and HAAGEN-SMIT (5) had already pointed out that the effect of adenine as a leaf growth factor in Cosmos was greater under short than under long exposure to daylight. Therefore we thought it might be worth while to ascertain whether during the natural short day-length in winter-months the effect of adenine under our conditions would perhaps be greater than we had observed up to this time.

As our previous experiments had showed clearly how important it is with such an investigation to eliminate a possible influence of the position beforehand all the pots irrespective of their groups were randomized.

In this experiment, which lasted from Nov. 13th 1943 till Febr. 1st 1944, we examined the influence of adenine 0.1 and 0.5 mg/l and of α-naphthylamine in the concentrations 0.1, 0.5 and 1.0 mg/l. Alternately every two or three days 50 ml of solution or distilled water was administered to every pot.

After the experiment was finished the 8 best specimens were selected from the 12 plants. After the measuring the weight was determined before and after drying. Owing to the slight development which is considerably less than it is during the months of summer this time both leaves of the second real leaf-pair of each plant, counting from the bottom, were weighed fresh and dry. The results are to be found in table IV.

TABLE IV.

Group	Number of plants	Solution applied (Nov. 3rd 1943— Febr. 1st 1944)	Average length in mm	Number of plants with flower-bud	Fresh weight (g) of: second real leaf pair	Fresh weight (g) of: shoots	Fresh weight (g) of: roots	Dry weight (g) of: second real leaf pair	Dry weight (g) of: shoots	Dry weight (g) of: roots
1	8	Shive (= S)	153	5	0.85	5.85	0.91	0.055	0.368	0.085
2	8	S + adenine 0.1 mg/l	145	6	0.77	4.76	0.67	0.053	0.325	0.063
3	8	S + adenine 0.5 „	147	4	1.10	6.55	1.10	0.068	0.417	0.119
4	8	S + α–N.A. *) 0.1 „	145	4	0.88	5.78	0.96	0.057	0.370	0.082
5	8	S + α–N.A. 0.5 „	134	3	0.74	4.65	0.82	0.047	0.295	0.068
6	8	S + α–N.A. 1.0 „	147	6	0.80	5.18	0.73	0.050	0.321	0.064

*) N.A. = naphthylamine.

We may conclude that there is a slight influence of adenine noticeable, 0.5 mg/l not yet being toxic, as established by the American investigators. This effect of adenine, however, is not clearly visible in the plants. It is remarkable that in this experiment 0.5 mg/l α-naphthylamine does not have a favourable influence, whereas this was the case in our previous tests.