deed be planted somewhat closer and the yield correspondingly increased.

A comparison of the nuts yielded by the two varieties shows points of favor for each one. The Mammoth nuts are much larger and handsomer and would be more attractive on the market. This is offset by the fact that the shells are much thicker and the kernels do not wholly fill the cavities but rattle around loosely, while the Spanish peanut has a paper-thin shell, closely surrounding the kernel, so that there is no waste space. The kernel of the Spanish peanut is short, almost like a pea, and remarkably solid.

An unexpected difference, much to the advantage of the larger peanut, lies in the labor involved in shelling the nuts. The thin, close-fitting shell of the Spanish peanut makes it exceedingly hard to shell the kernels rapidly, while this process is easy in the larger nuts. The extra work required when the Spanish nuts are to be shelled by hand more than offsets the ease in harvesting them.

Which variety would be most desirable to grow depends upon conditions. Where the season was rather short the Spanish would be better, and where the peanuts were raised for pig-pasture it would be much superior, as the only disadvantage of the Spanish nut, that of the labor of shelling the kernels, would here not be considered.

The purpose of taking the diameter of the nuts and kernels was to show the difference in waste as regards cross-section. The shells differed markedly in thickness, and this could not be satisfactorily compared, as the irregularities made such measurements of little value in themselves; moreover, there was an empty space between the kernel and shell of the Mammoth variety to be taken into consideration. The measurements of whole nuts and kernels show that the diameter of the kernel of the Mammoth peanut was about 58 per cent. that of the entire nut, while in the Spanish peanut it was a little over 75 per cent.

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Contact Action of Gabbro on Granite in Warren County, New York.[1]

While engaged in detailed field-work on the North Creek (Warren county) New York quadrangle, the writer found a fine example of contact action of gabbro on granite, which it is the purpose of this paper to describe.

The rocks of the region are all pre-Cambrian and these, named in relative order of ages, comprise the Grenville sedimentary series of various gneisses, limestone, and quartzite; the great syenite-granite intrusive masses; gabbro stocks or dikes; pegmatite dikes; and diabase dikes. The Grenville and syenite-granite series are highly metamorphosed and clearly gneissoid; the gabbro is only moderately metamorphosed; while the pegmatite and diabase are wholly unaltered.

The gabbro, which is of special interest here, almost invariably occurs in the form of small stocks or bosses (rarely as dikes) which break through the country rock (Grenville, syenite, or granite) in vertical, plug-like or pipe-like forms which on the geologic map show elliptical or nearly circular ground-plans. The gabbros are generally medium to coarse-grained, always holocrystalline, and they show every evidence of having been intruded under true plutonic conditions.

The contact metamorphism here described may be seen at the southern end of the gabbro stock (length ¾ of a mile) which lies just south of Mountain Spring lake or at a point 2 miles southwest of Pottersville. In a recently opened stone quarry, about 75 feet higher than the road on its east side, the rocks are laid bare in such a manner as to afford an excellent opportunity for the study of the contact zones.

The following nine zones, passing from the typical gabbro to the typical granite (country rock), have been studied in detail in the field and by means of thin-sections and hand-specimens:

[1] Published by permission of Dr. J. M. Clarke, New York State Geologist.

Zone 1.—Typical gabbro well within the gabbro stock. Nearly black, medium grained, and with diabasic texture. (Gradation from 1 to 2.)

Zone 2.—Syenitic phase of the gabbro stock and within a few feet of the granite. Dark gray, medium grained, and with granitoid texture. (Gradation from 2 to 3.)

Zone 3.—1 to 3 feet wide. Biotite-schist border phase of the gabbro stock. Secondary origin. (Sharp contact between 3 and 4 gabbro and granite.)

Zone 4.—4 inches wide. Hornblendite phase of the country rock (granite). Nearly black, medium grained, banded parallel to the gabbro-granite contact. (Fairly sharp contact between 4 and 5.)

Zone 5.—6 inches wide. Monzonitic phase of the country rock. Yellowish gray, medium to coarse grained, and banded parallel to the main contact. (Not very sharp contact between 5 and 6.)

Zone 6.—15 to 18 inches wide. Chiefly hornblendite phase of the granite, but with numerous very narrow streaks of No. 5. Nearly black, medium grained, and banded parallel to the main contact. (Sharp contact between 6 and 7.)

Zone 7.—3½ feet wide. Monzonitic phase of the country rock like No. 5. Yellowish gray, fairly coarse grained, and banded parallel to the main contact. (Not very sharp contact between 7 and 8.)

Zone 8.—7 feet wide. Monzonitic phase of the country rock. Light gray, fairly coarse grained, and not banded. (Gradation from 8 to 9.)

Zone 9.—Typical (country rock) granite. Pink, medium grained, and very gneissoid, but with gneissic bands striking at almost right angles to the main contact.

MINERALOGICAL COMPOSITION OF EACH CONTACT ZONE

Zone No.	Ortho-clase	Micro-porthite	Micro-cline	Plagioclase	Horn-blende	Hypers-thene	Quartz	Biotite	Magne-tite	Zircon	Zoisite	Pyrite	Garnet
1	5			Ol.-Lab. 45	14	20		6	2			1	2
2	32			Ol.-Lab. 10	45			6	2	little		little	5
3	Biotite-schist with some feldspar												
4	Like No. 6												
5	28			Ol.-And. 50	20		1		½	little	little		
6	15			Ol.-And. 5	72				7	½	½	little	
7	Like No. 5												
8	33			Ol.-And. 55	10		1			½	½	little	
9	40	15	4	Ol.-And. 5	5		30		½	little			½

A noteworthy feature is the fact that the strike of the foliation of the very gneissoid country rock is nearly at right angles to the gabbro-granite contact, while the clearly defined contact zones are parallel to the contact.

Other features of special interest are the syenitic border (except for the secondary biotite-schist) of the gabbro near the contact, and the almost complete absence of quartz from the granite within a dozen feet of the main contact. Thus the country rock (granite) is distinctly more basic near the contact, while the gabbro is distinctly more acidic near the contact.

Whether these interesting endomorphic and exomorphic changes are to be accounted for on the basis of assimilation of some of the country rock during the intrusion of the gabbro, or on the basis of the action of vapors from the intrusive, it at least appears quite certain that the gabbro must have been considerably superheated in order to have so

notably affected the granite. As judged by the mode of occurrence of the gabbro stock, the stoping hypothesis recently advocated by Daly or the hypothesis of marginal assimilation might be applied to account for the more acidic border phase of the gabbro, but the sharp contact of the gabbro against the granite would seem to preclude the possibility of accounting for the more basic contact zones of the country (granite) rock on the basis of actual assimilation of some of the granite by the gabbro.

William J. Miller

Societies and Academies

The American Mathematical Society

The nineteenth summer meeting of the American Mathematical Society was held at the University of Pennsylvania on Tuesday and Wednesday, September 10–11, extending through two sessions on Tuesday and a morning session on Wednesday. Twenty-nine members were in attendance. Ex-President H. S. White occupied the chair, being relieved by Professors E. S. Crawley and E. W. Davis. The council announced the election of the following new members: Professor W. A. Bratton, Whitman College; Professor Florence P. Lewis, Goucher College; Mr. Leslie MacDill, Indiana University; Professor H. W. March, University of Wisconsin; Mr. M. R. Richardson, University of Chicago; Dr. J. I. Tracey, Johns Hopkins University; Mr. H. S. Vandiver, Philadelphia, Pa. Five applications for membership were received.

On both days of the meeting luncheon was provided by the university. On Tuesday evening twenty-six of the members gathered at the usual dinner. The interval between the sessions was devoted to an inspection of the university grounds and buildings. On Wednesday afternoon several of the members made an automobile excursion about the city. At the close of the meeting a resolution was adopted expressing the thanks of the society for the generous hospitality of the university.

The following papers were read at this meeting:

R. D. Carmichael: "On the theory of relativity: analysis of the postulates."

F. H. Safford: "An irrational transformation of the Weierstrass γ-function curves."

E. L. Dodd: "The least square method grounded with the aid of an orthogonal transformation."

E. L. Dodd: "The probability of the arithmetic mean compared with that of certain other functions of the measurements."

H. Blumberg: "Algebraic properties of linear homogeneous differential expressions."

J. E. Rowe: "The relation between tangents and osculant $(n-1)$-ics of rational plane curves."

H. H. Mitchell: "Determination of all primitive collineation groups in $n(>4)$ variables which contain homologies."

Arthur Ranum: "Lobachefskian polygons trigonometrically equivalent to the triangle."

G. A. Miller: "A few theorems relating to Sylow subgroups."

Anna J. Pell: "Linear equations in infinitely many unknowns."

L. B. Robinson: "Invariants of two tetrahedra."

F. R. Sharpe: "The Klein-Ciani quartic."

F. R. Sharpe: "The $(2-1)$ ternary correspondence with a sextic curve of branch points."

F. R. Sharpe and F. M. Morgan: "A type of quartic surface invariant under a non-linear transformation of period 3."

S. Lefschetz: "Double curves of surfaces projected from S_4."

H. Blumberg: "Sets of postulates for the rational, the real and the complex numbers."

Oswald Veblen: "Decomposition of an n-space by a polyhedron."

F. N. Cole: "The triad systems of thirteen letters."

H. S. White: "Triple systems as transformations, and their paths among triads."

L. C. Karpinski: "Augrim stones."

Dunham Jackson: "On the approximate representation of an indefinite integral."

T. H. Gronwall: "Some special boundary problems in the theory of harmonic functions."

T. H. Gronwall: "On analytic functions of constant modulus on a given contour."

T. H. Gronwall: "On series of spherical harmonics."

O. E. Glenn: "A general theorem on upper and lower limits for the order of a factor of a p-ary form with polynomial coefficients."

E. J. Wilczynski: "On a certain class of self-projective surfaces."

The next meeting of the society will be held at Columbia University on Saturday, October 26. The San Francisco Section will meet at the University of California on the same day.

F. N. Cole,
Secretary