and apophyses, in contrast with four extrusives, Second Mountain being double.

The intrusive is considered of later age than the first extrusive, and may be contemporaneous with one of the later extrusives or subsequent to all of them. This conclusion is in harmony with the results of recent studies of the copper deposits, which are intimately connected with the intrusion of the great Palisades sill.

There are many points of resemblance to the Connecticut Valley traps: the same number of extrusives appear in both, grouped in the uppermost strata; in both the second is a double flow; an intrusive sill lies near the base, and dikes cut the intervening strata.

This paper was illustrated with maps and lantern slides.

Recent Investigations of the Potable Water Supplies of New Jersey: Dr. Henry B. Kümmel, State Geologist of New Jersey. The paper was illustrated with maps.

Some Volcanoes of the Western Mediterranean: Dr. Henry S. Washington.

The speaker described briefly the volcanoes of Catalonia, Sardinia, Pantelleria and Linosa, which he visited for the Carnegie Institution in the summer of 1905. The Catalonian eruptions are referred to two phases, a first of extensive lava flows, followed by the formation of numerous small cinder cones, the material being basaltic in every case, nephelite appearing in some types. The Sardinian occurrences consist of extensive sheets of basalt and trachyte of Tertiary age, with the two later large volcanoes of Monte Ferru and Monte Arci, both of which show an interior core of salic rocks (trachytes and phonolites at the former and rhyolite at the latter), covered by extensive mantles of basalt. The last phase of vulcanicity in Sardinia is seen in a long line of small cinder cones of recent date, much resembling those of Catalonia, in both form and material. The island of Pantelleria is quite complex, but here also the earlier eruptions were of trachytes and phonolites, the activity closing with the formation of small, basaltic, cinder cones. The small islet of Linosa, which is almost unknown, shows nine volcanic cones, two phases of eruption being evident: the first producing basalt tuff cones, and the second basaltic cinder cones, similar to those from the other localities. The paper was illustrated by numerous photographs taken by the speaker.

A Contribution to the Geology of Maine: Dr. Ida H. Ogilvie. The paper was read by title.

A Peridotite Dike in Coal-measures of Southwestern Pennsylvania: Professor J. F. Kemp and Mr. J. G. Ross. This paper will be published in the *Annals* of the Academy.

Alexis A. Julien,
Secretary of Section

Discussion and Correspondence

The Administration of the Ohio University

To the Editor of Science: A remarkable and, it is to be hoped, unique condition of affairs exists at present in the Ohio University. There is at least one spot in this "land of the free and home of the brave" where Russian administrative methods are in vogue. At a recent meeting of the board of trustees a member of the faculty was summarily dismissed. The president seems even to have willfully misled the man, for he discussed with him his work for next year only a few days before commencement. His dismissal was certainly not for incompetence. The charge against him was that he had unfavorably criticized the administration to one of his colleagues. Evidently the delator, who is the natural product of similar conditions everywhere, got in his nefarious work. One member of the board was guilty of the same conduct toward another member of the faculty, although he had always professed to be his special friend. Whether the discharged professor spoke the truth was not considered; he was condemned on ex parte evidence without being given a chance to be heard. Six years ago Alston Ellis, who had formerly been at the head of the Colorado Agricultural College, was chosen president. His career in that state was comparatively brief and would have

been briefer had he not voted for himself when he was proposed for reelection. He had hardly been installed at the Ohio University when he gave it to be understood that although there might be committees of the board and of the faculty, his fiat was final; the rest was mere matter of form. One member of the faculty, the oldest in length of service, resigned recently rather than submit any longer to being browbeaten or ignored. When committees of which he was a member were called together he was left out, because once or twice he had had the bad taste to differ with the president. Although a petition signed by about five students out of six was presented against the acceptance of the offered resignation no notice was taken of it officially. Under almost any conceivable conditions one would have supposed that the board might wish to know the cause of such an unusual step.

When names were proposed for honorary degrees the president arbitrarily rejected those of persons whom he thought unlikely to be of any service to him and added those whom he believed or assumed to be in position to requite the favor. Another specimen of the method the president has of making himself felt was the adoption of a resolution by the board—at least he says they did—*requiring* the attendance of the entire faculty at the morning chapel exercises. A request to this effect would have accomplished the same end without producing any ill feeling; but that would not have been a demonstration of his authority. As these exercises consist, for the most part, of a platitudinous speech twenty or thirty minutes long by the president, the performance is highly edifying to at least one person present. The slender attendance on the part of the student body evinces the interesting character of the exercises. For a number of years Albert Douglas, of Chilicothe, has cherished the ambition to succeed General Grosvenor as member of Congress. Being a trustee of the Ohio University, as was also one of his foremost champions, it occurred to them that here was a chance to make the higher (?) education serve some personal ends. With the active aid of the "college crowd" he was nominated by methods that reminded one of those in vogué in Central America except for the absence of fire-arms. What the voters of the district thought of the performance was shown by the ballot cast; for while that of the Democrats remained about the same the Republican vote fell off several thousand. As General Grosvenor had been elected ten times without, in any way, using the college to help him it is evidently not essential to an acceptable candidate. Now behold how things work together for good to them that love a congressman! One after another of Mr. Douglas' henchmen were placed on the college payroll. For the most unscrupulous member of the coterie a special office, that of alumni secretary, was created, although the number of living alumni outside of Athens probably does not exceed five hundred. If they had been consulted this man would not have received one vote in fifty. As neither he nor the president of the college is a graduate of the institution the transaction has a queer look, especially when we take into account the fact that the salary attached to the position is out of all proportion to the service rendered even if it were of the most efficient sort. Albeit, Mr. Douglas is an "honorable man," and declared, when accepting the nomination that he had made no promises of any kind and was under obligations to no one.

Some months ago one of the trustees was sued at law by a member of the faculty on the ground of a misappropriation of a sum of money entrusted to him several years previous for investment. After various delays, the animus of which was plainly evident to those conversant with the local situation, the suit was decided in favor of the plaintiff and the defendant ordered to return the money, including the cost of prosecution. This was done. As the man is absolutely penniless the question naturally arose, Where did the money come from? Later it transpired that a number of members of the faculty had been approached, at the instigation of the president, for a contribution, on the ground that it would be a misfortune to lose the services of

so valuable a member of the board. As he has all along been one of the most obsequious supporters of the president, having absolutely no will of his own, the grounds of his value are evident. To the credit of the faculty be it said, that most of them refused to be "grafted" for such a purpose. As the institution was founded to promote "religion, morality and knowledge" it is evident from what appears above and from much additional testimony that might be adduced that these terms are just now somewhat "liberally" interpreted.

Chas. W. Super

Athens, O.,
July 22, 1907

SPECIAL ARTICLES

Improvements in the Ultra-Violet Microscope

The resolving power of a microscope varies directly as the numerical aperture of the objective and inversely as the wave-length of the light employed.[1] In other words, the shorter the wave-length the smaller the objects that can be distinguished. Light of half the usual wave-length will show details one half the size of those seen with ordinary light.

The advantage of using light of extremely short wave-length for microscopic purposes has been known for many years and was given clear expression by Czapski in 1891.[2] For some time, however, little or nothing was done to carry out Czapski's suggestions, for several reasons. First, ultra-violet light is invisible to the eye and though able to affect the photographic plate energetically, can not be focused directly even on a fluorescent screen inserted in the camera in place of ground glass, on account of the weakness and indistinctness of the image when high powers are used. Second, the glass of which ordinary objectives are made is opaque to all but the relatively long waves of ultra-violet light which lie just beyond the visible spectrum, which rays give but slightly increased resolution. So little advantage could be gained that glass objectives corrected for ultra-violet light were never made.

Early in the present century, Köhler began experimenting with lenses of quartz and fluorspar, two substances very transparent to ultra-violet light. Such lenses could be used with ultra-violet of very short wave-length which would give greatly increased resolving power.

While Köhler was in the midst of these experiments von Rohr, in 1902, made a great discovery. He invented a new system of lenses made of only a single substance, yet almost perfectly corrected for spherical aberration for light of a certain definite wave-length.

Herschkowitsch shortly before had learned how to make optically homogenous melted quartz in fragments large enough for the minute lenses of a microscopic objective. Under Köhler's energetic leadership, these discoveries were utilized at once and within two years he was able to describe a complete outfit for using ultra-violet rays in photomicrography and to publish numerous plates showing the remarkable performances of this new ultra-violet microscope.[3]

These new lenses, called monochromats, are corrected for ultra-violet light of one definite wave-length—a bright line in the spark spectrum of cadmium whose wave-length is 0.275 μ, or as more commonly written, 275 $\mu\mu$. With ordinary light composed of many wave-lengths, the images given by the monochromatic objectives are distressingly bad, blurred and fringed with rainbow colors due to chromatic aberration, for which the lenses are not at all corrected. It is out of the question to focus the object with such light, and the statement pub-

[1] This is commonly expressed by the formula $d = \lambda/2A$ where d = size of smallest detail resolved by the microscope, λ = the wave-length of the light employed, and A = the numerical aperture of the objective.

[2] Czapski, S., Die voraussichtlichen Grenzen der Leistungsfähigkeit des Mikroskops, in *Zeitschr. f. wiss. Mikroskopie*, 8: 145–155, 1891.

[3] Köhler, Aug., Mikrophotographische Untersuchungen mit ultra-violettem Licht, in *Zeitschr. f. wiss. Mikroskopie*, 21: 129–165, 273–304, Figs. 1–8, Pls. 1–6, 1904.