not good usage. The Latin word is properly "*fetus*" in both singular and plural. One error in citation has been noted, *viz.*, "The Anatomy of the Domestic Animals," by Dr. Septimus Sisson, is referred to as the work of "A. Sisson." These are, however, minor errors which undoubtedly will be corrected in later editions. Professor Baumgartner, out of nearly twenty years experience in the teaching of large classes in comparative anatomy, has produced this manual for which he deserves the thanks of all teachers of that subject. He thus makes available for their use a form the availability of which has not been so widely realized as it deserves.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLIFIED METHOD OF MICRO-COMBUSTION: THE MICRO-DENNSTEDT METHOD

WHILE we have no doubts as to the excellency of the micro-combustion methods of Pregel, we have encountered practical difficulties, which have forced us to abandon them. Micro-methods are gaining increased importance in biochemistry and a practical and easy method for determining the composition of organic substances in 5–10 mg quantities will open up new fields of research. Our work concerns mainly the determination of nitrogen according to Dumas and of carbon and hydrogen. In micro-Dumas, according to Pregl, we have obtained constantly too high results, while according to Dubsky the results were right from the start. The main difference in these two methods is the placing of the reduced copper in the tube and passing of the carbonic acid. We have combined the useful points of the two methods, namely, the combustion tube and Kipp apparatus as source of carbonic acid from Pregl, the placing of the reduced copper at the end of the tube and passing of CO_2, after the air is expelled, in small stream according to Dubsky. The results in this way are excellent.

Our main work concerns, however, the determination of carbon and hydrogen. Here, according to Pregl's method, we had out of seventy analyses seven good results, in spite of great care exercised in keeping to the original recommendations of the author. We have adapted the Dennsted's method for micro-work and had from the start almost 100 per cent. of good results and it seems surprising that this simple and excellent method has not been adapted before for the said purpose. The details of the method will be published elsewhere, and we wish here only to state the main advantages of our procedure: (1) An almost empty combustion tube, except for boats with absorbing substances, in which all the combustion is plainly visible; (2) the capacity and constancy in weight of the absorption apparatus, which last at least for 30 combustions, if not much more; and (3) the great ease with which the method can be acquired by workers familiar with the macro-combustion. Seven to ten days' practice is entirely sufficient for this purpose.

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SPECIAL ARTICLES

BASIN RANGE STRUCTURE AT JEROME, ARIZONA

ON a recent trip to Jerome, I was impressed, as on a much earlier visit, with the superb outlook from that town, when viewed with geological eyes, and was led to wonder why neither I nor apparently any one else had particularly called attention to the bearing of the structure, here so grandly displayed, on the problem of the origin of the Basin Ranges.

Jerome lies on the steep eastern front of a considerable mountain mass, known as the Black Hills, and overlooks to the east the Verde Valley. The town is roughly 2,000 feet higher than the Verde and nearly as great a distance below the summit of the Black Hills.

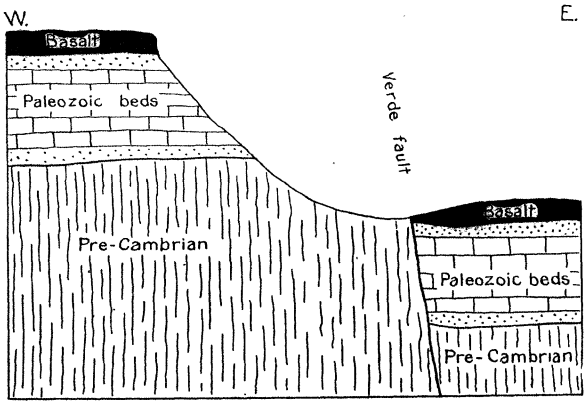
The geology of the district has been well worked out by Dr. L. E. Reber, geologist for the United Verde Copper Company, and those who wish may readily consult his paper.[1] For present purposes it is sufficient to state that at Jerome pre-Cambrian crystalline rocks are unconformably overlain by nearly horizontal Paleozoic beds with a total maximum thickness of about 1,500 feet. These in turn are overlain unconformably by basaltic flows of late Tertiary age, which still have a thickness of about 700 feet on the Black Hills, west of Jerome.

The outstanding structural feature of the district, as has been recognized by many, is a great normal fault which has a general north-northwest strike and outcrops along the eastern face of the Black Hills. The town of Jerome is situated on this fault and the major effects of the dislocation are plainly visible on the surface and in the mine workings. It is clear that the rocks east of the fissure have gone down relatively to those west of the fissure and that the throw is approximately 1,600 feet. North of Jerome, some of the same late Tertiary basalt that caps the Black Hills can be seen faulted down against

[1] Reber, L. E., Jr., "Geology and ore deposits of Jerome district," Trans. Am. Inst. Min. and Met. Eng., Vol. 66, pp. 3–26, 1922.

the pre-Cambrian. These relations are shown in the following diagrammatic sketch.

East of Jerome, between that town and the Verde River, are at least two other faults of similar character but probably smaller throw, so that the above section, if continued eastward, would show a succession of down-stepped blocks. These faults are apparently northward branches from what, south of Jerome, is a single great fault zone.



Diagrammatic section showing faulting at Jerome, Arizona

The points that deserve emphasis are (1) that the Black Hills with relation to the Verde Valley is an uplifted fault block; (2) that the faulting, inasmuch as it displaces basaltic flows that can scarcely be older than late Tertiary, is relatively recent; (3) that the basalt on top of the Black Hills is the same as that some 1,600 feet lower, just north of Jerome, and probably, also, the same as that known to underlie the thick accumulation of lake beds in the bottom of the Verde Valley; (4) that there is no evidence that the basalt on the Black Hills was ever covered by later sedimentary or volcanic deposits; and (5) that the present Verde Valley could not have been in existence when the basalt flowed over what is now the upper part of the Black Hills. The conclusion that the distinction between the Black Hills and the Verde Valley arose in late Tertiary or early Quaternary time as a consequence of block faulting is, I believe, inevitable, and Jerome deserves to take rank as a clearly demonstrable example of a type of structure which most geologists believe to be characteristic of the Basin-and-range province.

The existence, in Verde Valley, of a series of lake beds at least 2,000 feet thick, resting on basalt, and of supposedly late Tertiary or early Quaternary age[2] is additional evidence for the conclusion that the valley is essentially a structural feature and not a valley of erosion, although of course erosion has modified its original form.

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[2] Jenkins, O. P., Verde River lake beds near Clarkdale, Arizona: *Am. Jour. Sci.*, 5th ser., Vol. 5, pp. 65–81, 1923.

THE AMERICAN MATHEMATICAL SOCIETY

THE two hundred forty-second regular meeting of the American Mathematical Society was held at Columbia University on Saturday, May 2, 1925, extending through the usual morning and afternoon sessions. The attendance included sixty-three members of the society. There was no meeting of the council or of the trustees.

At the beginning of the afternoon session an address was made, at the request of the program committee, by Mr. J. R. Carson, of the American Telephone and Telegraph Company, and Dr. T. H. Gronwall, on "The Heaviside operational calculus and its application to electric circuit theory." A number of engineers and physicists were present by invitation at this session.

The following other papers were read:

The operational calculus: NORBERT WIENER.

Analytic approximations to topological transformations: NORBERT WIENER and PHILIP FRANKLIN.

Functions with assigned derivatives: PHILIP FRANKLIN.

On the types of division algebras: OLIVE C. HAZLETT.

On conditions for self-dual curves: T. R. HOLLCROFT.

The invariant system of two associated bilinear connexes: O. E. GLENN.

Algebraic surfaces with reducible bitangent and osculating hyperplanar sections: MARIA CASTELLANI.

The elementary divisors of a real symmetric matrix: J. H. M. WEDDERBURN.

The absolute value of the product of two matrices: J. H. M. WEDDERBURN.

The algebraic structure of the formulas in plane trigonometry: T. H. GRONWALL.

The behavior at infinity of the gamma and associated functions: T. H. GRONWALL.

A canonical form for biunivocal continuous sense-preserving transformations of a sphere: NORBERT WIENER.

Ricci's canonical congruences: HARRY LEVI.

Operations of Boolean algebras: ORRIN FRINK.

Alternatives to Zermelo's assumption. Preliminary report: ALONZO CHURCH.

Projective normal coordinates for the geometry of paths: OSWALD VEBLEN and J. M. THOMAS.

Conformal correspondence of Riemann spaces: J. M. THOMAS.

Asymmetric displacement of a vector: J. M. THOMAS.

On the inverse problem of the calculus of variations: J. H. TAYLOR.

On a certain functional equation: J. P. BALLANTINE.

ARNOLD DRESDEN,
Assistant Secretary