SCIENTIFIC JOURNALS AND ARTICLES

THE contents of the *American Journal of Science* for May are as follows: "Contributions to the Geology of the Grand Canyon, Arizona.—The Geology of the Shinumo Area," by L. F. Noble (Part I.); "Additions to the Pleistocene Flora of Alabama," by E. W. Berry; "Application of Potassium Ferricyanide in Alkaline Solution to the Estimation of Arsenic, Antimony and Tin," by H. E. Palmer; "New Cystid from the Clinton Formation of Ontario—Lepadocystis clintonensis," by W. A. Parks; "New Petrographic Microscope," by F. E. Wright; "New Ocular for Use with the Petrographic Microscope," by F. E. Wright; "Behavior of Crystals in Light Parallel to an Optic Axis," by C. Travis; "Some Simple Improvements for a Petrographical Microscope," by A. Johannsen; "Natural Naphtha from the Province of Santa Clara, Cuba," by C. Richardson and K. G. Mackenzie; "Intrusive Granites and Associated Metamorphic Sediments in Southwestern Rhode Island," by G. F. Loughlin.

SPECIAL ARTICLES

THE CRITICAL SPARK LENGTH

REMOVING the condensers from the influence machine in order to avoid strong disruption discharge, the insulated metal sheet referred to in a former communication[1] placed between the terminals, separates the positive column from the Faraday dark space. In these two regions the mica wind-mill shows that the air-column is moving in opposite directions. In the dark space Franklin's fluid is carried by convection. The air molecules are overloaded. They flow from the cathode knob to the plate, to which they deliver their charge. On the positive side of the plate the air molecules have everywhere a less than normal charge. Franklin's fluid has been drained out of them and into the anode. The discharge here involves a transfer of Franklin's fluid (Thomson's corpuscles) from molecule to molecule. This operation is attended by luminous effects. Here the convection air current and the electrical discharge are moving in opposite directions. If the metal plate be removed, the opposing air currents will mingle. The length of the Faraday space, where the discharge is mainly by convection will now in general have changed. It becomes less sharply defined.

[1] April 22, p. 628.

If the anode knob is moved up to the Faraday dark space, we have the critical spark length when disruptive discharge is feeble on account of small capacity.

If the knobs are brought nearer together, the positive or luminous discharge surrounds the Faraday region where convection prevails. A further decrease in the distance between the knobs increases the cross section of the column where the non-luminous convection-transfer occurs. The luminous discharge is crowded out into longer arc-like paths. This luminous column is what is usually called the discharge. The air current here forms a return for the convection currents within the Faraday dark space. All of these phenomena have been studied in open air, and photographic evidence will be presented in a paper to be at once published by the Academy of Science of St. Louis. Canal-ray effects obtained when the metal plate is provided with an opening have also been photographed. The Hittorf tube referred to by Thomson[2] is a most striking illustration of phenomena which are above described. In the shorter branch the dark convection discharge involves a transfer of gas molecules which in this case forms, with the gas-flow in the longer branch, a continuous circulation around the circuit of the two branches.

FRANCIS E. NIPHER

[2] "Conduction of Electricity through Gases," 2d ed., p. 443.

THE SAN LUIS VALLEY, COLORADO[1]

POPULARLY the San Luis Valley or park is supposed to be the southernmost one of a chain of four great parks, of which North, Middle and South parks are the others. In

[1] Published by permission of the director of the United States Geological Survey.

reality, the southern continuation of that series is found in Wet Mountain Valley and Huerfano Park, occupying a depression between the Front Range and Wet Mountain axis and the Mosquito Range and Sangre de Cristo axis, whereas the San Luis Valley occupies a depression west of the latter axis, and between it and the Sawatch Mountains. Furthermore, the former depression began to take shape much earlier—as far back as the Triassic at least—and has been subject to sedimentation more or less continuously from that time until the Pleistocene, whereas the San Luis Valley shows no formations older than Miocene Tertiary, and is for the most part occupied by late Tertiary or early Quaternary sediments.

In the San Luis Valley there may be distinguished two classes of more or less unconsolidated gravels, sands, and clays, an older series of conglomerates with intercalated lava flows, known as the Santa Fe formation, after Hayden, and a younger overlying series of blue clays with interstratified sand beds.

Alamosa Formation.—For the younger upper series of blue clays with interstratified water-bearing sand beds, which occupies the bottom of the valley proper, the name Alamosa formation is here proposed, from the town of that name near the center of the valley.

SECTION OF HANSEN'S BLUFF

	Feet
Gravelly slope	4.0
Conglomerate, indurated sandy clay matrix	4.0
Fine gravel and sand, loose	3.5
Fine-grained reddish sand	2.5
Black and red sand	0.5
Drab joint clay with a great many white indurated nodules	1.5
Coarse indurated sand and small quartz pebbles	4.0
Buff to light-drab sandy clay	10.5
Fine and coarse sand in laminæ	5.5
Olive-green sandy joint clay, with shells	2.5
Banded drab sand with clay pockets	1.0
Fine and coarse pebbly sand in indurated laminæ	4.5
Loose black sand	1.5
Fine banded clayey sand	1.5
Coarse sand and clay with quartz pebbles	2.5
Débris slope to river	12.0

The low relief of the valley region renders natural exposures of the Alamosa formation very scarce, the best one being afforded by Hansen's bluff on the east bank of the Rio Grande, nearly east of the Peter Hansen ranch house, and about eight miles southeast of Alamosa.

Wells in the trough of the valley, at Alamosa, east of Mosca, and at Moffat, which penetrate the Alamosa formation to depths of from 1,000 to nearly 1,300 feet, show alternations of blue clay, fine sand with some gravel, and, occasionally in depth, boulders. The water-bearing beds of sand are found at intervals of twenty to thirty feet, separated by beds of blue clay. The depth of the first sand yielding a flow at the surface varies with the amount of water drawn from that bed, being greater near the regions of denser population and in the central portion of the valley. The flows from the different water-bearing sands are of different pressures and volumes, depending on the depth and thickness of the sand beds. Through these variations it is possible to correlate the sand beds for considerable distances in a region where the wells are numerous, and so to establish the continuity of the beds.

The Alamosa formation is readily shown to lie unconformably upon the Santa Fe formation though the contact along the west margin of the valley is everywhere concealed by the long, gravelly, alluvial slope. There is stratigraphic discordance shown by the fact that the lava flows intercalated in the Santa Fe formation dip toward the valley at an inclination averaging 10°, while the sand beds of the Alamosa formation slope toward the center of the valley with an inclination of less than 1°. In the western and southern parts of the valley several isolated hills composed of the Santa Fe formation project upward through the Alamosa formation. The latter formation abuts directly against the Santa Fe formation in the San Luis Hills at the southern end of the valley. These hills and outliers exhibit a much older topography than the younger valley formation.

The age of the Alamosa formation is

either late Pliocene or early Pleistocene. It has been shown to be separated from the Santa Fe formation, of Miocene age, by an important erosion interval. It can be shown to be preglacial on stratigraphic grounds. Alluvial fans and slopes are widely developed about the sides of the valley. The great Rio Grande fan occupies a fourth or more of the whole valley bottom. The water-bearing sands conform to the contour of the fan, showing that it was developed contemporaneously with the deposition of the formation. Likewise on the east side of the valley the alluvial fans and slope of the Sangre de Cristo range blend and are contemporaneous with the sands and clays of the Alamosa formation. The Pleistocene valley glaciers of the west side of the range just reached down to the alluvial slope and their concentric terminal moraines surmount the crests of the alluvial cones, spreading out from the valleys as the author has previously noted.[2] The sediments of the fans and of the Alamosa formation are therefore preglacial. The valley glaciers of the Rocky Mountains of both the earlier and later periods of glaciation are regarded as rather late Pleistocene. The best age determination that can be made from a stratigraphic standpoint, therefore, is that the Alamosa formation is either late Pliocene or early Pleistocene. Four species of fresh water shells collected at Hansen's Bluff, in the uppermost strata of the formation, are identified by Dall as a Quaternary assemblage.

C. E. Siebenthal

THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

The first annual meeting of the society was held in affiliation with the American Association for the Advancement of Science in the Harvard Medical School, Boston, Mass., December 30 and 31, 1909. The sessions were presided over by Dr. L. R. Jones. The society starts with 130 charter members. Fifty members were in attendance and the meeting was regarded as a great success. The rooms and other facilities provided by the local committee were very satisfactory.

[2] *Jour. Geol.*, Vol. XV., 1907, p. 15.

The following officers were elected for 1910:

President—Dr. F. L. Stevens, North Carolina College of Agriculture and Mechanic Arts.

Vice-president—Professor A. F. Woods, College of Agriculture, University of Minnesota.

Secretary-Treasurer—Dr. C. L. Shear, U. S. Department of Agriculture.

Councilors—Dr. L. R. Jones, University of Wisconsin; Professor A. D. Selby, Ohio Agricultural Experiment Station; and Professor H. H. Whetzel, Cornell University.

It is expected that the next annual meeting of the society will be held in conjunction with the American Association for the Advancement of Science at Minneapolis, Minn.

The society empowered the council to undertake the publication of a phytopathological journal if the necessary financial and editorial arrangements could be made.

The membership fee for the year 1910 was fixed at one dollar, with the provision that in case a journal was established during the year an assessment of one dollar more should be levied upon each member to cover subscription to the journal for the remainder of the year.

A letter from the Society for the Promotion of Agricultural Science, requesting the Phytopathological Society to appoint a committee for the purpose of considering the question of affiliation of the two societies was read. The society accepted the request and instructed the president to appoint a committee of three for the purpose. Dr. Chas. E. Bessey, Mr. F. C. Stewart and Dr. John L. Sheldon were designated later.

Upon motion the society voted to direct the president to appoint two delegates as representatives to the International Botanical Congress, which is to be held in Brussels in May. Dr. W. G. Farlow and Dr. C. L. Shear were appointed.

The society also adopted a motion providing for the appointment by the president of a committee of five to draw up rules and make recommendations concerning the common names of plant diseases. The president appointed Dr. F. L. Stevens, Dr. H. von Schrenk, Dr. E. M. Freeman, Mr. W. A. Orton and Dr. G. P. Clinton.

Owing to the recent introduction of two serious plant diseases, the yellow wart disease of the potato, caused by *Chrysophlyctis endobiotica*, and the white pine disease, caused by *Cronartium ribicolum*, into America, the society unanimously adopted a motion directing the president to appoint a committee of five to draft appropriate resolutions regarding these diseases and take