

along a line 400 miles in length. "They do not break out from bluffs or fall in cascades, but appear as pools, often in the level prairie. . . . The pools are carpeted with exquisite water-plants, forming a waving mass in which may be seen many fishes. So transparent and crystalline are these waters, that objects 15 to 20 feet below the surface appear only a foot away. No tint of surface *débris* or of storm sediment mars the crystal clearness, for they are purified by rising through nature's filter, a thousand feet of the earth's strata." These are natural artesian wells, the water being forced from the ground by hydrostatic pressure acting from many miles away. In his summing-up of the Grand Prairie, Professor Hill remarks: "I drove during the great drought of 1877 from Decatur to Fort Worth [about 50 miles] over a rich, grass-clad region, without being able to secure a drop of water for myself or team the entire distance, while dozens of suffering teamsters were begging and trying to buy water from the owners of the few and all but exhausted surface wells along the way. With the knowledge now before us, every foot of that vast area of the Grand Prairie, being underlaid by water, could be cut into 40-acre tracts, upon each of which, if flowing water could not be obtained, magnificent negative wells rising nearly to the surface could be obtained, furnishing an abundance of waters unaffected by drought."

The "red beds" of Oklahoma, Texas, and New Mexico occupy an area of about 100,000 square miles and receive their name from the color of the rocks, "glaring vermilion or deep-brown chocolate sometimes prevailing, varied only here and there by a bed of snow-white gypsum." The principal area is about 350 miles long by an average of 150 miles wide. The whole series is considered to be "probably a single unbroken formation, representing the sediments of an ancient inland sea." This country is not favorable for the finding of artesian water, although a few surface wells occur at intervals. The Llano Estacado is a plain of about 50,000 square miles area, nearly level, unbroken by trees or bushes, and unseamed by water-channels. Its name is from

the Spanish, meaning a wall or palisade, and is derived from the fact that there is a steep and abrupt declivity on all sides but that toward the south east. It is practically without surface water, there being only a single running stream throughout its whole extent, and this has a length of only about 10 miles, when it is swallowed up in the earth. The cause is found in the porosity of the soil which allows the rain to soak into it immediately. This circumstance, however, is favorable for securing water by wells, and accordingly it is found that wherever they have been dug, water has been found. With water upon its surface, the sterile character of the great Llano will soon be a thing of the past.

We cannot go further into the details of Professor Hill's report here, but must content ourselves with saying that it is to be hoped it may be published in some more accessible form than in a government document that is limited to an edition of less than 1,500 copies.

The report of Professor L. E. Hicks deals mainly with the conditions in Nebraska, and we have an account of the geological structure of the State as related to underground waters. He also considers the irrigable lands and gives an interesting account of the Loup Valley, which lies on the borders of the humid and the arid regions, where rainfall is sometimes abundant and again scanty. It becomes, therefore, a matter of great practical moment to ascertain the possibility of irrigating the land. This can only be done in the valleys, the rest of the country being cut and scarred in a peculiar and intricate way. The capacity of the Loup River for irrigation is limited to about 1,000,000 acres of land, and, as it happens, this is also the amount of land that is capable of irrigation. The last report in the volume is by Professor G. E. Culver, who treats of the artesian wells of the Dakotas.

Part IV. of this report is by J. M. Gregory and F. F. B. Coffin. The part written by the former is general in its character and treats of the conditions in western Nebraska, Kansas, and Okla-

Publications Received at Editor's Office.

- ANDREWS, EDMUND AND ANDREWS, E. W. Rectal and Anal Surgery. 3d ed. Chicago, W. T. Keener. 164 p. 8°.
- BROWN, J. C. People of Finland in Archaic Times. London, Kegan Paul, Trench, Trubner & Co. 200 p. 12°.
- CROTHERS, SAMUEL McCHORD. Members of One Body. Boston, Geo. H. Ellis. 132 p. 12°. 75 cts.
- FOOTE, HENRY W. The Insight of Faith. Boston, Geo. H. Ellis. 115 p. 24°. 50 cts.
- HINCKLEY, F. A. Afterglow. Boston, Geo. H. Ellis. 81 p. 24°. 50 cts.
- HOPKINSON, JOHN. Original Papers on Dynamo Machinery and Allied Subjects. New York, W. J. Johnston Co. 249 p. 12°.
- HOUSTON, E. J. Electricity and Magnetism, being a Series of Advanced Primers of Electricity. New York, W. J. Johnston Co. 306 p. 12°.
- JAMIESON, ANDREW. Applied Mechanics. Philadelphia, Lippincott. 268 p. 12°. \$1.25.
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- SAVAGE, M. J. The Evolution of Christianity. Boston, Geo. H. Ellis. 178 p. 12°. \$1.
- TOWNSEND, C. H. TYLER. N. A. Genera of Calyptrate Muscidae; N. A. Tachinidae; New Jamaica Tachinidae; Mexican Species of Ceroplastes; Leaf-miner of Populus Fremonti. Reprints. Las Cruces, N. M., The Author.
- VILLEMAIN, M. Souvenirs des Cent Jours. Ed. by G. Sharp. New York and London, Longmans, Green & Co. 188 p. 12°. 75 cts.

Reading Matter Notices.

Ripans Tabules: best liver tonic.
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CALENDAR OF SOCIETIES.

Anthropological Society, Washington.

Dec. 13.—Place-Names in the District of Columbia; Symposium; Discussion of Report of Special Committee; communications, W. J. McGee, On Principles of Nomenclature; O. T. Mason and Edward Goodfellow, On the General Subject.

Agassiz Club, Corvallis, Ore.

Nov.—F. L. Washburn, Oökinosis in Limax and Arbacia, prefacing the paper with illustrated remarks on karyokinetic phenomena in general. The paper set forth the results of some personal observations on living and sectioned eggs.

Fact and Theory Papers

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