

and to these, and the auxiliary chemical work which they involve, the residue of its energies has been directed. These experiments include comparisons of green rye with rye ensilage, and of dried fodder-corn with corn ensilage, as food for milch-cows; field trials with fertilizers on various crops and on various typical soils in the state; experiments upon sorghum as a sugar-producing plant, and preliminary work on sweet-potato disease.

Not all of these experiments are of the highest order; but they are accurate and painstaking, and they touch the actual interests of the farm more closely than any mere laboratory

work, however excellent, can do. The experiments on sorghum were mainly upon the effect of fertilizers upon the yield of sugar, and gave the interesting result that the yield of sugar was more favorably affected by potash than by any other single substance, and that, with the addition of nitrogen to the potash, the largest yield of sugar per acre was obtained. Sulphate of potash surpassed the 'muriate' in every case. Both sorghum bagasse and seed (the whole plant cut for fodder) and sorghum ensilage proved very satisfactory fodders for cows and pigs.

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

Geological survey.

Mineral springs in eastern Tennessee. — Mr. F. M. Pearson, who carried on topographic work for the survey last summer in eastern Tennessee, reports that the section of the state upon the map of which he is now engaged is full of mineral springs belonging to the classes of sulphur and chalybeate springs. He mentions particularly Bean's Station Valley, in Grainger and Hawkins counties, as being the locality of some twenty springs, a number of which have been improved, and are places of resort. On the north-western side of the valley lies the 'Poor Valley Ridge,' which extends for a distance of some thirty miles from the north-east to the south-west. This ridge is separated from the Clinch Mountain, which is on the north-west and parallel with it, by a depression or hollow known as 'Poor Valley.' In the latter, numerous small streams rise, separated by low divides, which, after flowing in the valley for short distances either south-west or north-east, turn and reach Bean's Station Valley through gaps in the Poor Valley Ridge. At every one of these gaps on the south-east side of the ridge, sulphur springs are found. Most of these springs are unimproved, as far as conveniences for using the waters are concerned; but those at which hotels have been built are among the most popular places of resort in the state. Beginning at the south-west, where the ridge abuts against the Clinch Mountain, the first springs of importance are 'Lee's Springs,' which are situated at the extremity of the Poor Valley Ridge, or rather partly between it and the Clinch Mountain. Powder Spring (named from the odor of the sulphuretted-hydrogen gas), at Powder Spring Gap, five miles farther to the north-east, is the next important locality. Following the ridge fifteen miles from this point, toward the north-east, brings one to 'Tates Springs,' one of the most noted localities in Tennessee. There are good accommodations here; and stages connect with the Eastern Tennessee, Virginia, and Georgia railroad

at Morristown. Stages connect 'Lee's Springs' with Strawberry Plains, a station on the same railroad.

Hale's red and white sulphur springs, in Hawkins county, five miles north of Rogersville, are also resorted to, and are on the same line as the other springs enumerated. There are also several chalybeate springs on or near the same line, in Hawkins and Grainger counties. Other well-known watering-places, determined by the presence of mineral springs, in the region surveyed by Mr. Pearson, are 'Montvale Springs' in Blount county, 'Oliver Springs' in Anderson county, 'Austin Springs' in Washington county, and 'Galbraith's Springs' in Hawkins county.

Burk's Garden, in Virginia. — The peculiar topographical system of long narrow valleys, with streams flowing from their opposite ends to the middle, and thence at right angles across or through one of its boundary ridges, which is one of the striking features of the physical geography of the country surveyed by Mr. Morris Bien in the southern Appalachians (described in *Science*, No. 56), gradually changes, as it is traced north-eastward from the valley of east Tennessee, until in Tazewell county, the northern county of south-western Virginia, is found the most southerly instance of a topographical feature common in Pennsylvania. This is Burk's Garden, a beautiful oval valley, eight miles long by four and a half miles wide. It is surrounded by a ridge averaging more than twelve hundred feet in height. The valley contains some of the richest blue-grass land in the state. Its drainage forms one of the heads of Wolf Creek, which affords numerous examples of sink-hole drainage, so common in the area surveyed by Mr. Bien. This stream leaves the valley by flowing through the western side of the oval range in a deep and rugged gap, or cañon as it would be called in the west. This valley well deserves the name of 'garden,' for it is one of the most beautiful spots in Virginia. The first glance recalls Johnson's description of 'Happy Valley' in Rasselaïs, and it is without doubt destined to become a popular mountain resort.

It is located in the southern part of Tazewell county. South-east of it is the valley of Holston River, in which there are large gypsum deposits. The fertility of Burk's Garden may perhaps be due to the presence

of gypsum. Elk Garden, in Russell county, south-west of Tazewell, is somewhat like Burk's Garden, but not so well defined, although it may have been so in the past.

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Trenton natural history society.

April 8. — Mr. F. A. Lucas arraigned the English sparrow, *Passer domesticus*, as a nuisance; stating, that, after several seasons of careful scrutiny, he had never seen the bird capture or destroy a single larva. It will chase butterflies, fight with our native birds, and drive them away; it will devour the grain of the farmer, and the seeds cultivated for commercial purposes; but to do any thing useful is against its principles. It is stated by J. H. Gregory, a veteran seed-grower, to be one of his greatest enemies. Mr. Lucas referred to contests which he had witnessed between *Passer domesticus* and *Picus pubescens*, the hard-working *Certhia familiaris*, *Troglodytes aedon*, and *Regulus satrapa*; in some instances several sparrows uniting in the attack. He had also seen the bird perched on a tree whose branches were loaded with webs of certain caterpillars, without even noticing them, but waiting for the crumbs from the break-fast-table. The pestiferous foreigner is, in this state, protected by law, a penalty of five dollars being imposed for the killing of one. — Dr. A. C. Stokes communicated a paper on *Cynips quercus-cornigera* of Osten-Sacken, exhibiting the spinous galls and several microscopic dissections of the fly, especially of the ovarian tubules, to show the arrangement of the pedunculated eggs. The numerous tubules are in two clusters, radiating from common centres. The peduncle of each egg is twisted about the egg next to the rear; so that, when deposited on the twig, the stem is directed upward, and develops into the hollow, thorn-like body projecting from the gall. The fly escapes by gnawing a small hole in one side of this body, above the surface of the excrescence. Several mature flies were removed from these woody capsules in December; and from the same gall, at the same time, were taken larvae and pupae. — At a previous meeting, Prof. Austin C. Apgar referred to the spawning of *Fulgur canaliculata*, stating that the eggs were deposited every month, except, perhaps, in the winter. A recent experience on the New-Jersey coast has led to the belief that spawning may take place at any season. In the region about Cape May these long clusters of egg-cases are popularly supposed to be the skeletons of defunct snakes.

Engineers' club, Philadelphia.

April 5. — Mr. Henry G. Morris gave a brief description of an atmospheric elevator, consisting of a closed cage or car working in an air-tight well; the air-pressure, supplied by a 'Root' or other pressure blower, being admitted to the top or bottom of the cage in descending or ascending. The doors at the

different stories opening inwards, the pressure of air keeps them closed until the interior of the car is brought opposite, when, the pressure being relieved, the door can be opened into the car. The car being counterbalanced, only a comparatively slight pressure of air, equal to a water-column of from six to eight inches only, is required to move an average load on a car six feet square. The escape of air beneath the car being at all times readily controlled by the attendant, it is impossible for the car to descend at a dangerous speed; and other obvious features render this form of elevator comparatively safe. — Mr. Henry G. Morris also exhibited a sample of seamless copper tube which had been compressed endwise under a steam-hammer, and showed peculiar foldings of the metal into overlapping equilateral triangles forming an interior hexagonal section. — Mr. John T. Boyd described a new design for parlor-cars for the Pennsylvania railroad. — The secretary presented for Mr. Edward Parrish an illustrated description of Powers's disinfecting-tank and automatic siphon. — Mr. William L. Simpson exhibited a remarkably perfect casting of a toad, the pattern used being the toad himself.

Minnesota academy of natural sciences, Minneapolis.

March 4. — Mr. C. L. Herrick mentioned the recognition of a genus of lynceid crustaceans, *Monospilus*, new to America. *M. dispar* is peculiar among Cladocera, in that, living in the filth at the bottom of pools, it not only fails to completely moult its periodically produced coverings, but fails to develop the compound or imago eye, while the macula nigra persists through life as the functional visual organ. This most interesting form has outward resemblances to *Iliocryptus*, while its real affinities seem to be with the higher lynceids from which its habits have degraded it. Mr. Herrick regards the Minnesota form as identical with that of Europe. He also presented a tabular statement of the distribution of the fresh-water crustacea of the orders Cladocera and Copepoda; showing a remarkable conformity between the faunas of Minnesota and Scandinavia, and a very large percentage of identical species. Southward, toward the Gulf of Mexico, the number of species becomes less, while the percentage of new species increases. Several species rarely found in Minnesota become common southward, and these are always species differing from those of Europe. Such species, however, represent usually intermediate species between extremes found associated at the north, or links between genera. Such species are *Simocephalus daphnoideus* Herr., which is a link between *Simocephalus* and *Daphnia* and *Scapholeberis angulata* Herr., which stands related to