might be made on the chapter concerning sulfur in proteins (p. 36).[2] The author's surmise (p. 32) that the Millon's reaction given by gelatin may be due to an impurity is scarcely justified since the work of Pickering, Van Name and Mörner.

The appended bibliography is useful, although by no means complete.

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SPECIAL ARTICLES

NOTES ON SOME SALAMANDERS AND LIZARDS OF NORTH GEORGIA

The following salamanders and lizards were observed at Thompson's Mills, Gwinnett County, north Georgia, during the summer of 1908.

Among the batrachians of the order Urodela, the following salamanders were found.

Plethodon glutinosus (Green). This is a thick, stout-bodied, nearly cylindrical species, and is capable of secreting a viscid, milky juice, which has given it the name of the sticky salamander. Specimens found at Thompson's Mills, Ga., in life, were dark bluish slate above, lighter or paler on the belly. The back and head were thinly sprinkled with tiny, grayish-white dots, with a few whitish or grayish dots beneath, mainly on the throat. The sides were mottled with grayish, forming an almost continuous band to the end of the tail. Length 5¼ inches. Several specimens of this salamander were found at the above locality, all beneath logs and the bark of decayed, fallen trees, in shady, damp woods. This salamander is terrestrial in its habits, and occurs in the extreme north as well as throughout the south. It is not uncommon at Thompson's Mills, Ga.

The red salamander (*Spelerpes ruber* Daudin). At maturity this is a thick, plump, short-bodied species, with small, weak legs. Its skin is clear, smooth, without glands, but besprinkled with shallow pits.

The specimens found at Thompson's Mills were 4¼ to 5 inches long. In living specimens the coloration above was brick-red, very much paler (or pinkish) on the belly. The back and head were thickly and uniformly sprinkled with black dots about the size of pinheads. Along the sides these dots became much smaller and more scattered, and were completely wanting along a line drawn along the sides connecting the outer attachment of the legs. The legs were of the same color as the back, and finely dotted with black.

This pretty salamander also ranges over the eastern portion of the country. At Thompson's Mills, I found only two individuals, both beneath rotten logs in hilly woods. This species is of more aquatic habits, which probably accounts for the fact that an examination of hundreds of rotten stumps and logs in the upland woods yielded only two specimens.

Spelerpes gutto-lineatus (Holbrook). This is a very pretty, slender and elongated animal, with a slender, compressed tail, longer than the body. Living individuals which I have found at Thompson's Mills showed the coloration described as follows. Beginning just back of a line joining the eyes, a narrow, black stripe extended along the back bone, to a point just behind the legs where it terminated abruptly. Bordering this stripe on either side, is a light grayish-brown stripe beginning at the tip of the nose and extending just above the eyes. These light, dorsal stripes unite on the tail where the black, spinal stripe terminates. On each side beginning from the eye, another narrow, black stripe extended to the tip of the tail, narrowing in proportion as the tail becomes more attenuated. This lateral black stripe was spotted with whitish marks, and its lower edge outlined with white. The belly was evenly and thickly mottled with yellowish and light gray. I found only two specimens of this salamander at Thompson's Mills, both under a log in wet ground near a brook. Their lengths were 7 inches and 5¾ inches, respectively. This salamander is mostly southern in its range.

[2] Cf. *Jour. Amer. Chem. Soc.*, 1902, XXIV., 140.

Desmognathus fusca. This small, aquatic salamander occurs in the brooks at Thompson's Mills. In its coloration, this species shows great variability. In March of the season 1908, I found some small individuals in a brook at the above locality.

Among the lacertilia, the following lizards were found at Thompson's Mills.

The blue-tailed skink (*Eumeces fasciatus* Linnæus) is exceedingly common at the above locality and elsewhere in the south. In every field and wood, they may be found basking in the sun or running with great rapidity over the ground, until they seem only a streak, hence the common name streak-field. I have very frequently captured this skink under the bark of fallen trees, and in decayed stumps. As the sun goes down, these creatures seek shelter in stumps and logs, and stone-heaps, etc., where they may be readily found. During the early part of the summer, at the egg-laying period, these pretty lizards were frequently to be found in hollow stumps and logs. Under date of June 13, 1908, I find a record in my field journal, of a male and a female skink together with seven eggs, in a cavity under the bark of a rotten log. The eggs were lying in a group on the decayed wood beneath the bark, and showed the following dimensions:

	Length, Cm.	Width, Mm
1	1.35	8.5
2	1.25	9.5
3	1.35	9.0
4	1.20	9.0
5	1.30	8.5
6	1.25	8.0
7	1.30	9.0

These eggs were perfectly elliptical, with a white, tough membrane for a shell, and contained young lizards. I have frequently found this lizard in the crevices and hollows of dead trees a considerable distance from the ground. Captured, it tries very hard to escape, and will snap viciously at one's fingers, although it can do no injury. The coloration of this species is very brilliant, with a high luster. The older males are commonly known as scorpions, and are considered extremely poisonous.

Sceloporus undulatus (Latreille). This common lizard is familiar to nearly every one throughout the south. At Thompson's Mills, it is very abundant in all wooded upland situations, and loves to bask in the hot sun, stretched out lazily at full length on a fence-rail or rock. Disturbed, it runs with great agility, usually up the nearest tree. On the tree-trunk, it moves so that it keeps the tree between itself and the observer, as does a gray squirrel. Its coloration should be of very protective nature, as the dull-grayish and brownish markings very closely assimilate with the general grayish and brown colors of tree-trunks, lichen-covered rocks, etc. This gentle lizard when caught, makes little or no great effort to escape. I kept one for a considerable time on an upstairs porch of my dwelling at Thompson's Mills. Every day it came out from the vines and basked contentedly in the sun. This lizard feeds on all kinds of insects, including grubs, large grasshoppers, etc. I once witnessed one of these creatures attempting to capture a large grasshopper which had got among the grass and weeds in a thicket by the roadside. The grasshopper—one of the very large species—could not readily fly away on account of the grass and weeds, but dashed about, with the lizard following every movement, and in hot pursuit. To an observer witnessing this active chase, it would appear that this lizard must be able to see pretty well, although Dr. Abbott concluded that the vision of this lizard is not very acute. At another time, in the vicinity of Thompson's Mills, I came across one of these lizards, which scurried up a tree on my appearance. Something large and white was protruding from its mouth, causing the lizard to breathe in long, painful gasps. I killed the creature and found an enormous, hairy grub half swallowed head first. The grub was too large for the lizard to swallow, and could not be ejected, so that its mouth was forced wide open, and breathing rendered extremely difficult. At other times I have frequently watched these lizards snapping up very rapidly the tiny insects it met with on trees and logs.

Most of the specimens obtained were kindly identified for me by Dr. Stejneger, of the U. S. National Museum.

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SOCIETIES AND ACADEMIES

THE GEOLOGICAL SOCIETY OF WASHINGTON

The 220th meeting of the society was held at the Cosmos Club on Wednesday evening, May 12.

Regular Program

Significant Time-breaks in Coal Deposition: Mr. Geo. H. Ashley.

In a study of the results which were recently published in *Economic Geology*, it was found that one foot of bituminous coal, if deposited under present-day conditions, would require at least three hundred years for its laying down.

Considering the known variation in the thickness of single coal beds, the question arises as to whether it may not prove possible to use a coal bed as a measuring rod for the time of deposition of other beds in the coal measures. Thus, in the case of a bed 15 feet thick in one district and 18 inches in another, if the coal in each case were deposited at the same rate, the 15-foot bed required *at least* four thousand years longer than the 18-inch bed. Study was made to see if where the coal was thin there was a compensating thickening of the adjoining rocks. As far as the study was carried no such compensating thickening could be found. It was therefore assumed that in the cases examined the thin bed of coal represents approximately all of the deposit made at that point during the time required for the deposition of the thick bed near by. This resulted from either slow growth or time-breaks either in or just preceding or following the thin coal bed itself.

A study of the rate of deposition of certain peats in Europe leads to the conviction that in many cases the difference in thickness is due to difference in rate of deposition, while in other cases the difference would seem to be due to time-breaks or periods of non-deposition.

The evidence of these time-breaks may consist of "smooth partings," which, as in the Lower Block coal of Indiana, may locally show as unconformities between the under- and overlying beds, or of smooth partings which are represented in other districts by up to 40 feet of shale and sandstone, as in Coal IV. of Indiana. In other cases one or two inches of cannel coal or bone may be represented in an adjoining district by a thick parting, as in the Moshannon bed, west of Houtzdale. In some beds partings of clay, shale or sandstone, where they are known, are uniformly thin and regular. In other beds they will vary from one fourth inch up to 40 or 50 feet. In such cases the great thickness of the parting often suggests, even though it does not prove, a considerable time interval.

A study of the problem seems to indicate clearly that the elements of slow growth and of temporary non-deposition can not be eliminated from it, and that it would be scarcely right to say that the rocks forming a parting in the coal, or that a certain thickness of rocks above or below the coal, may have taken a certain number of years for their deposition, equivalent to the time represented by the difference in the thickness of the coal at that point and at the point of greatest thickness, multiplied by an assumed rate of deposition of the coal.

Cretaceous Geology of the Carolinas and Georgia: L. W. Stephenson.

The belt of Cretaceous deposits which, with certain interruptions, extends along the inner margin of the coastal plain from Marthas Vineyard, Mass., to Cairo, Ill., has its widest areal development in the region of southeastern North Carolina and northeastern South Carolina.

In North Carolina three Cretaceous divisions are recognized. The oldest of these is of lower Cretaceous age, and consists of about 275 feet of light-colored, coarse, generally compact or partially indurated, feldspathic, cross-bedded sands with inter-stratified lenses of massive more or less sandy clays. So far as known these materials are non-fossiliferous. The beds are separated from the overlying Cretaceous strata by an unconformity. Employing physical criteria, the division has been correlated approximately with the Patuxent formation of Virginia and Maryland. The name Cape Fear formation was proposed for this terrane by the writer in a paper entitled "Some Facts Relating to the Mesozoic Deposits of the Coastal Plain of North Carolina," which appeared in 1907.

The next younger division, which is of upper Cretaceous age, consists of 500 to 600 feet of dark to black lignitic, irregularly bedded and for the most part laminated, sands and clays, with interbedded marine lenses in the upper portion. As regards their structural relations the beds rest