

In the quarries at North Buffalo the disconformity between the Bullhead and Onondaga was studied. This time-gap is faintly marked, but very careful study has shown that a thin layer of sandstone, in some places hardly more than a single layer of Quartz sand grains, lies between the two disconformable formations. In one place there is a remarkable dike of the intervening sand injected into the underlying formations, extending clear through the Bull-head into the Bertie.

On the return trip from Buffalo to New York the party made one stop at Portage to examine the upper gorge of the Genesee River, and the upper Devonian formations exposed there. Members of the party who desired to do so then joined the students from the School of Mines for a week's field work in the region about Newburgh, where the crystalline rocks of the Highlands and the stratigraphy and structure of the Skunnemunk Mountain region were studied and mapped in detail.

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PRELIMINARY NOTE ON THE EMBRYOGENY OF  
SYMPLOCARPUS FÆTIDUS SALISB.

LAST year Mr. W. H. Lippold, while engaged in graduate work in the botanical department of the University of Minnesota, undertook a study of the embryo-sac development and embryogeny of *Symplocarpus fœtidus* Salisb.

The work was not carried to completion, some important points being left undecided because of lack of material. The writer, upon the suggestion of Professor Lyon, has taken up the unfinished work and hopes to bring out in a subsequent paper an account of the observations made.

Some interesting facts have already been established and it seems advisable to call attention to these at the present time. Briefly stated they are as follows:

The gynœcium is almost always one-chambered, although two chambers infrequently occur.

The ovule is solitary, axial, orthotropous and pendant from the roof of the chamber.

The two integuments which are formed do not completely enclose the nucellus.

A massive endosperm develops and rapidly consumes the nucellus, the inner and outer integuments, and pushes back into the basal tissue of the ovule.

The protocorm soon assumes a somewhat campanulate shape with a short, thick suspensor at its narrower, proximal end.

The radicle and plumule are both differentiated at the suspensor end of the protocorm.

The developing protocorm completely consumes the endosperm as well as all the remaining ovular tissue except the base of the hilum, which remains closely appressed to its broad end.

*The embryo, therefore, comes to lie free in the chamber of the gynœcium without any trace of seed coats or enveloping membranes.*

The mature embryo is nearly spherical and measures 8-11 mm. in diameter.

The epidermal and subepidermal cells have their walls considerably thickened, while the walls of the former are distinctly cuticularized.

The metacormal axis is short and bent back upon itself, the plumule lying close to the radicle.

The so-called 'seeds' of *Symplocarpus fœtidus* are naked embryos.

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LOWER PALEOZOIC FORMATIONS IN NEW MEXICO.<sup>1</sup>

THE older Paleozoic strata have generally been considered absent in New Mexico. During the past summer, while engaged in field work for the U. S. Geological Survey, under the direction of Mr. Waldemar Lindgren, the undersigned found Cambrian, Ordovician, Silurian and Devonian formations at various places along a belt which crosses Grant, Sierra and Luna counties, and extends from the east side of the Rio Grande westward beyond the Arizona line and probably connects with the similar formations of the Clifton copper district in Arizona.<sup>2</sup>

<sup>1</sup> Published by permission of the director, U. S. Geological Survey.

<sup>2</sup> W. Lindgren, professional paper, U. S. Geological Survey, No. 43.

The localities where these rocks are best exposed are the Caballos Mountains, the Hillsboro and Kingston mining districts on the east side of the Black Range, in the vicinity of Cooks Peak and the Florida Mountains. In these places the Cambrian, Ordovician and Devonian are found. At Lake Valley and west of Silver City, near the mines of Chloride Flat, in addition to the foregoing formations, true Silurian limestone separates the Devonian and Ordovician strata.

A more extended account of these formations will appear in a forthcoming number of the *American Journal of Science*.

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#### A NEW METHOD FOR THE HOMOPLASTIC TRANSPLANTATION OF THE OVARY.

THE transplantation of the ovaries has been performed by Knauer, Gregorieff, Arendt, Ribbert, Schultz, Herlitzka, Foa, Guthrie, etc. These experiments showed that young ovaries are often able to 'prendre' (or grow successfully), while the transplantation of adult ovaries is practically unsuccessful. These negative results are probably due mainly to the defective technic employed, the usual method being to sew the transplanted ovary to the peritoneum, and leaving to nature the reestablishing of the circulation. In order to obtain constant results, it is necessary to use a much more precise method. Therefore, we attempted to transplant an ovary by modifying as slightly as possible its circulation, its innervation and its connections with the Fallopian tube.

We used our method of *transplantation in mass*, which permits the transplantation of ovaries of cat, with their vessels, and preserves a part of the nervous apparatus of the organ.

The abdomen of a cat *A* being open, a large peritoneal flap, extending from the right ovary to the portion of the aorta corresponding to the mouth of the ovarian artery, is cut by proper incisions. The Fallopian tube is severed near its fimbriated extremity. The posterior surface of the peritoneal flap is carefully separated from all the posterior tissues

excepting the ovarian vessels, which are permitted to retain their connection with it. Then the segments of the aorta and vena cava, from which the ovarian vessels originate, are extirpated. The specimen consisting of the ovary and a part of the Fallopian tube united to the segments of the aorta and vena cava by a cellulo-peritoneal ribbon and the ovarian vessels, is then placed in a glass of isotonic sodium chloride solution.

The abdomen of a cat *B* is then opened by performing a right half circular transversal laparotomy. The right ovary and the external part of the Fallopian tube are resected. The aorta and vena cava are cut at the point of the mouth of the ovarian vessels. The anatomical specimen taken from cat *A* is removed from the salt solution and put into the abdominal cavity of cat *B*. The segments of the aorta and vena cava of cat *A* are interposed between the cut ends of the aorta and vena cava of the cat *B*. The peritoneal flap is stretched on the posterior abdominal wall in such a manner that the transplanted ovary takes the place of the normal ovary. The circulation through the aorta and vena cava is reestablished. The red blood flows through the ovarian artery, the ovary becomes rosy, and the dark circulation is slowly established through the venous plexus and the ovarian vein. After a few minutes the circulation appears similar to that of the normal ovary. The end of the transplanted Fallopian tube is united to the end of the normal one. At last the suture of the abdominal wall is performed.

This operation is not dangerous, for the animals after a few hours appear to be in normal condition. Our experiments were performed on ordinary laboratory animals of uncertain breeds. They are interesting, therefore, only from a technical point of view. We intend to very soon perform a series of similar operations on pure bred animals, preferably dogs or pigs, with a view of studying the problem of transmission of characters and related problems.

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