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MSS. intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION G—BOTANY.

SECTION G of the American Association for the Advancement of Science met at New Orleans during convocation week. In the absence of the chairman, Dr. Erwin F. Smith, the meetings of the section were presided over by Professor S. M. Tracy, and by Professor B. L. Robinson, past-chairman and vice-president of the association. The vice-presidential address, by Professor Robinson, has been printed in full in this journal.

The following papers were presented:

The Secretion of Salt by the Leaves of Spartina Stricta: F. H. BILLINGS.

Improvement of the Quality of Grapes: T. V. MUNSON.

The Preparation of Non-toxic Distilled Water: B. E. LIVINGSTON.

Ascidia in Fraxinus: GEORGE H. SHULL.

Specimens, photographs and drawings were exhibited to show the occurrence of ascidia in *Fraxinus Americanus,* and this occurrence was construed as a strong support for the thesis that variations of plants and animals are narrowly limited in kind by the characters they already possess. Although this abnormality must be extremely rare in *Fraxinus,* and has never been recorded, there is a group of young trees near the station for experimental evolution on which it is a frequent occurrence. Of thirty trees taken consecutively eleven bore 103 ascidia, the other trees being entirely normal. The relation of these

abnormal leaves to the normal pitchers of *Sarracenia* and *Nepenthes,* and to the peltate leaves of many other species, was recalled, and it was shown that the relation between the pitcher and the peltate leaf rests upon the ratio between radial and tangential growth of the leaf tissue, and that this ratio fluctuates about a definite mean value for a particular position in any given species, whether the development occurs in a complete circle or in a broken circle. This ratio determines the narrowness of the ascidium, as well as many other details of leaf form, such as plications, curled and upturned edges, etc. It was observed that this ratio was apparently greater in the ascidia than in a normal leaf and it was suggested that this appearance is due to the development of a sector of leaf tissue in the place of the normal sinus, and that this sector must be taken into account when comparing the ascidium with the normal leaf. Exception was taken to the frequently expressed idea of fusion, the essential feature of the ascidium being described as due to the retention of a capacity for further radial development by certain cells in the median dorsal line, which cells normally lose this capacity at a very early stage of development. It was noted that the ascidia could be referred to two types, the more common form involving the basal margin of the leaf, the other being located within the leaf and leaving the basal margin normal. The former was called a seamless ascidium. It comprised a little over 50 per cent. of the cases, and the seamed ascidia were found in about 47 per cent. Several peculiar combinations of the two types were noted. The stalk of the seamless ascidium differs from a normal petiolule in that it is cylindrical and contains a single concentric bundle, the normal stalk containing, in addition to this, two small collateral bundles running beneath two ridges which are continuous with the leaf margins. A strongly marked periodicity in the position of the ascidia in the leaf was found to agree closely with that found by Miss Tammes for their occurrence on the branches of Tilia, which fact suggests the morphological similarity of leaf and branch. This period for *Fraxinus* was as follows: Of 103 ascidia 96 were on terminal leaflets, five on the ultimate pair of lateral leaflets and two on the penultimate pair. This occurrence of ascidia on the terminal leaflets agrees with recorded observations on other species having polyphyll leaves and this fact was adduced as further evidence of orthogenesis. When the two leaves at any node spread laterally, they show a strong tendency to be symmetrical with regard to the occurrence of ascidia, but when they spread in a vertical plane, only the lower leaf bears an ascidium. The extreme localization of ascidia-bearing ash trees was presented as evidence of their recent origin at this particular spot, and the fact that a large number of individuals of various ages possess this structure was held to be strong evidence in favor of their inheritability, but both the origin and inheritance must await demonstration by pedigree-culture.

Phytogeography of Florida: P. H. Rolfs.

(I.) A discussion of the general conformation of Peninsular Florida giving a general outline of the topographic regions. (II.) The distribution of pine woods. Plants associated with this formation. (III.) The scrub formation and its plant association. (IV.) The mangrove formation and its associates.

The Florida Strand: P. H. Rolfs.

A discussion of the Florida strand showing the principal plants with effect of location on various species.

The Everglades: P. H. Rolfs.

A general description of the everglades

giving the plant societies and conformation of the surface.

The Development of Armillaria mellea; The Development of Agaricus campestris: GEO. F. ATKINSON.

These papers described the development of the sporocarps from the homogeneous condition up to the differentiation of the parts of the mature structure.

The Behavior of the Pollen Tube in Houstonia cœrulea: CHESTER A. MATHEWSON.

The ovules of this plant are without integument and there is therefore no micropyle. The course of the pollen tube is analogous to that described by Lloyd for other Rubiaceæ. It follows the style as far as the basal element of the ovary partition. Here it enters the tissue of the placenta stalk, and following this it enters the placenta. It reaches the ovule through the funicle and is then directed to the egg end of the embryo sac.

Ring Formation in Artificial Cultures: GEORGE C. HEDGCOCK.

Further studies have been made of the formation of fruiting rings in artificial cultures on agar media of *Cephalothecium* and *Penicillium,* and the same character noted in cultures of other fungi. Cultures were grown in the dark, and in ordinary light, establishing that the type of formation studied occurs only under the influence of light. Next, cultures were grown under rays of light transmitted through solutions of orange, red, blue and green in addition to the previous conditions. Under the effect of blue rays and in the dark no rings were formed, while rings were formed under the other conditions. The rings formed consist of alternating daily masses of denser spore formation. Daily fruit rings were observed with cultures of *Mucor* and *Hormodendron,* in addition to those already reported. These rings must not be confused with those of the type described by Milburn on certain kinds of media with *Hypocrea rufa,* since the latter were not formed daily, each occurring during a much longer period.

Notes on the Morphology and Embryology of the Nymphaceæ: MEL. T. COOK.

As a result of the recent work of Conard and others the writer has again taken up the study of this family, using Cuban material for the work. Members of the genus *Nymphæa* correspond with the writer's previous work upon this group. Members of the genus *Castalia* show some differences in that the embryo sac is not so long and the embryo has a suspensor. Members of the genera *Bracenia* and *Cabomba* correspond with *Nymphæa* in the enlargement of the embryo sac. All embryos show monocotyl characters, but some show characters similar to those of dicotyls. The Cuban species of *Castalia* show more striking dicotyl characters than our northern species.

North American Species of Peridermium: J. C. ARTHUR and F. D. KERN.

This paper dealt with certain fungi growing on the leaves of various coniferous trees, and sometimes on the limbs. A half dozen kinds form large swellings on the branches and trunks of pines and do much injury, not only decreasing their value for lumber, but ruining small trees in nurseries. Altogether twenty-six species are described, a number of them being new.

Stomatal Action and Transpiration in Fouquieria splendens and Verbena ciliata: F. E. LLOYD.

The evidence derived from the comparative study of these two types leads to the conclusion that there is no close correlation between transpiration and stomatal action. The maximum opening of stomata is reached some hours earlier than the maximum of transpiration, and, further, wide variations in the rate of transpiration may take place without any change in the size

of stomatal openings. No evidence is found for the ' temporary opening ' of Fr. Darwin.

Absorption of Atmospheric Moisture by Desert Shrubs: V. M. Spalding.

The prolonged period during which *Fouquieria splendens* and some other desert shrubs remained in full leaf in the summer and fall of 1905 suggested the probable connection of this fact with the unusually high relative humidity which prevailed during that period.

Experiments were carried out with twelve different species of perennials to ascertain whether they are capable of absorbing water vapor directly from the atmosphere. Leaves and other parts were accurately weighed before and after exposure to a saturated atmosphere.

The leaves of *Fouquieria* do not absorb water from the atmosphere, but the buds and branches are capable of such absorption. In the case of *Celtis pallida* and a number of other species there is no satisfactory evidence of the absorption of water vapor from the atmosphere by the living parts of the plant before pathological changes set in. Experiments with *Covillea tridentata* indicate a positive, though limited capacity for leaf absorption. Other plants vary in their deportment in this respect.

There is no evidence that the extremely small amounts of water absorbed in this way are utilized in the body of the plant, but there is every reason to conclude that high relative humidity proves to be a decided advantage to various desert plants in time of drouth by preventing excessive transpiration of the leaves and thus prolonging the period of their physiological activity.

Correlation between Ovules and Matured Seeds in Leguminous Fruits: J. A. Harris.

The paper is a study of the variability of ovules and matured seeds in the fruits of *Cercis, Cassia, Wisteria* and a garden bean. The series of constants is as yet too small to permit of any comparisons of the coefficients of regression of matured seeds on ovules with those found in inheritance, but the material promises some interesting results along this line. The regression would seem to be an obstacle to the fixing of the extremes of fluctuating variability by natural selection.

The Structure and Cytological Changes accompanying Secretion in Nectar Glands of Vicia faba: Charles R. Stockard.

The author finds that the nectar glands on the stipules of *Vicia faba* contain layers of cells whose contents have different chemical reactions, which fact is indicated in living material by their differences in color. This probably points to a difference in metabolic activity in the cells, since those of definite layers have similar reactions. The color response of the cells to acids and bases is the typical litmus change; acids causing the cell contents to become red, bases changing it to blue.

The nuclei are granular in structure, often coarsely vacuolated with one or more plasmosomes surrounded by vacuoles. Their shape tends toward spherical, but in old glands they become shrunken and slightly irregular in form. The position of the nucleus in the secreting cell varies greatly, but is more often near the cell center. It is never observed to give out granular material directly to the cytoplasm, though evidence is strongly in favor of the fact that it does transmit a substance to the cytoplasm which finally forms, or causes to form, granules that take in the older glands the nuclear stains. In rare cases the nucleus loses its chromatin in old glands and colors with plasma

stains, staining with the acid fuchsine of Auerbach.

The cytoplasm undergoes changes in structure as secretion progresses, first becoming vacuolar, then slightly granular, still taking plasma stains, and finally densely granular staining with the nuclear dyes. There is evidence to indicate that the cytoplasmic changes are controlled by the nucleus.

The nucleus seems to be the center of metabolic activities participating in the formation of the secretion substance, but playing a passive rôle in the actual process of secretion or extrusion of material from the cell.

The following are the titles of papers presented at a joint meeting of the section and the American Mycological Society:

Some Reasons for Desiring a Better Classification of the Uredinales: J. C. ARTHUR.

Uredineæ of the Gulf States: S. M. TRACY.

North American Gill Fungi: F. S. EARLE.

Lichens and Recent Conceptions of Species: BRUCE FINK. (By title.)

Cultures of Colletotrichum and Glœosporium: P. H. ROLFS.

The Affinities of the Fungus of Lolium temulentum: E. M. FREEMAN.

Peridermium cerebrum Peck and Cronartium Quercum (Berkeley): C. L. SHEAR.

Ramularia: An Illustration of the Present Practise in Mycological Nomenclature: C. L. SHEAR.

Notes on Pachyma cocos: P. H. ROLFS.

Penicillium glaucum on Pineapple Fruits: P. H. ROLFS.

The Occurrence of Fusoma parasiticum Tubuef in this Country: PERLEY SPALDING.

Some Peculiar Fungi New to America: W. G. FARLOW.

FRANCIS E. LLOYD,
Secretary.

SOCIETY OF AMERICAN BACTERIOLOGISTS.

THE seventh annual meeting of the Society of American Bacteriologists was held in the New Medical Building, University of Michigan, December 28 and 29, 1905.

Professor Edwin O. Jordan, president of the society, gave the introductory address on 'Variation in Bacteria.'

The following papers were presented:

Preliminary Communication upon a Spirochætal Infection of White Rats, and Observations upon the Multiplication of the Spirochætes in Fluid Medium: Drs. NORRIS, PAPPENHEIMER and FLOURNEY, Pathological Laboratory, Bellevue Hospital, New York.

With the blood of a case of relapsing fever, the authors were able to inoculate successfully monkeys and white rats. The following is a summary of the results obtained:

1. A subcutaneous inoculation in white rats, with blood containing spirochætes, is followed in the course of two or three days by the presence of more or less numerous spirochætes in the circulating blood. These persist from one to three days.

2. Unlike the spirochætal infection of man and monkeys, no relapses occur.

3. The rats show no obvious symptoms of illness, no local reaction, no visceral lesions of consequence, save turgescence and enlargement of the spleen.

4. In all, a series of about twenty-five generations have been kept alive through rats.

5. Observations show that immunity is conferred by previous infection. Inoculation of spirochætal blood, plus small doses of serum from animals that have gone through a previous infection, retards, or completely inhibits, the development of the spirochætæ in the circulating blood of rats. Subcutaneous inoculation of serum, fol-