and also the winter range, reached by migratory movements. The characters cited are divided into two groups, those which may be studied in the museum, and those which may be observed in the field. The latter include peculiarities of voice or song, which are often strongly characteristic of birds which would be hard to distinguish in life by vision alone. There are recognized thirty species, but these are increased to sixty-seven if we count all the subspecies. What is a subspecies? It is a recognizably distinct population which in some part of its range intergrades with one or more allied populations, all together constituting the species. Such subspecies, regarded objectively, may in certain cases owe their characters to the direct effects of a special environment. These have no proper genetic basis, and are not equivalent to true subspecies as recognized in taxonomy. But it is clearly brought out by modern research that genuine subspecies may have two different sorts of origin; they may arise by gradual differentiation from a parent stock, or they may be due to the crossing of two distinct types, which would otherwise be regarded as good species. In the one case, the subspecies represents a stage in the origin of species; in the other, it represents the breaking down of specific characters which have developed in isolation. Thus, for instance, Ernst Mayr in a paper just published, on the Birds of New Guinea, points out that *Megapodius affinis* and *eremita* are very distinct, but on Dampier Island they meet and freely cross, no physiological barrier having arisen to prevent it. Hence they must be treated as a single species. Ticehurst, in his treatment of subspecies of warblers, shows that a very curious condition may arise. He finds that two subspecies may develop from a common species, and spreading outward become increasingly distinct. At length, they may happen to invade each other's territory, and when so doing, may behave as perfectly distinct species, keeping distinct from one another. This happens in the case of the forms of *Phylloscopus trochiloides,* as is explained in detail, with a map. A very interesting case is that of *Phylloscopus borealis kennicotti* (Baird, 1869), the only member of the genus which reaches North America. It has evidently come over from Asia, and while it breeds in Alaska, it still migrates southward in the winter along the coast of Asia, and not at all along our Pacific Coast. The migration route is thus older and more persistent than the subspecies.

Another noteworthy fact is that whereas a species may go far south in migration, and thus have an immense range, it may nevertheless throw off satellites, if one may so call them, which become permanent residents somewhere along the path of migration. Thus *Phylloscopus collybita canariensis* is a permanent resident in the western group of the Canary Islands, while *P. c. exul* occurs only on Lanzarote, in the same archipelago. These cases recall some on the islands off the west coast of North America. *Regulus calendula obscurus* (also one of the Sylviidae) occupies Guadalupe Island; while the humming-bird, *Selasphorus alleni sedentarius,* instead of migrating to Mexico, is a permanent resident on Santa Catalina, San Clemente and Santa Cruz Islands.

T. D. A. COCKERELL

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SOCIETIES AND MEETINGS

THE VIRGINIA ACADEMY OF SCIENCE

THE Virginia Academy of Science held its seventeenth annual meeting in Danville on May 4, 5 and 6 with weather conditions favorable for its two field trips, one in biology and one in geology. There was much interest in a new section on engineering, which presented a program of 16 papers.

The finance committee brought in an encouraging report, and so two new lines of work were undertaken by authorizing the incoming president to appoint (1) a committee to encourage the formation and foster the development of science clubs in the high schools of the state, (2) a committee to establish an official academy publication which will probably be known as the *Virginia Journal of Science.* The academy also referred to its conservation committee for especial consideration the problem of the conservation and preservation of the Dismal Swamp.

The academy prize of $50.00 was awarded to M. J. Murray and Forrest F. Cleveland, of Lynchburg College, for a paper entitled, "The Use of Polaroid in Depolarization Measurements on Raman Lines," and the Jefferson Gold Medal was awarded to G. M. Shear and H. D. Ussery, of the Virginia Polytechnic Institute, for a paper entitled, "Frenching of Tobacco Distinguished from Thallium Toxicity by Spectrographic Analysis."

In the sectional meetings Astronomy, Mathematics and Physics presented 20 papers; Biology 13; Botany 7; Zoology 10; Chemistry 26; Education 12; Engineering 16; Geology 18; Medicine 9; and Psychology 7, making a total of 138 besides a symposium on "Organic Analytical Reagents" and a round table on "The Problems of Applied Psychology."

The following officers were elected: Ruskin S. Freer, of Lynchburg College, *President;* Wortley F. Rudd, of the Medical College of Virginia, *President-elect;* E. C. L. Miller, of the Medical College of Virginia, *Secre-*

tary-Treasurer; and I. A. Updike, of Randolph-Macon College, *Assistant Secretary.* New members of the council are: C. E. Myers, of the State Board of Education; Preston Edwards, of Sweet Briar College; and Marcellus H. Stow, of Washington and Lee University.

The new officers of sections are as follows:

Astronomy, Mathematics and Physics: Chairman, Alexander Vyssotsky, of the University of Virginia; *Secretary,* F. B. Haynes, of the Virginia Polytechnic Institute.

Biology: Chairman, Bruce D. Reynolds, of the University of Virginia; *Sub-Chairman,* J. G. Harrar, of the Virginia Polytechnic Institute; *Secretary,* Lena B. Henderson, of Randolph-Macon Woman's College.

Chemistry: Chairman, W. J. Frierson, of Hampden-Sydney College; *Secretary,* William G. Guy, of the College of William and Mary.

Education: Chairman, John Alex Rorer, of the University of Virginia; *Secretary,* Paul G. Hook, of Clifton Forge.

Engineering: Chairman, Albert H. Cooper, of the Virginia Polytechnic Institute; *Secretary,* D. H. Pletta, of the Virginia Polytechnic Institute.

Geology: Chairman, E. R. Casto, of Emory and Henry College; *Vice-Chairman,* E. C. H. Lammers, Washington and Lee University; *Secretary,* William M. McGill, of the Virginia Geological Survey.

Medicine: Chairman, Carl C. Speidel, of the University of Virginia; *Secretary,* Guy W. Horsley, of Richmond.

Psychology: Chairman, Richard H. Henneman, of the College of Willian and Mary; *Secretary,* William M. Hinton, of Washington and Lee University.

The meeting next year will be at the Randolph-Macon Woman's College, Lynchburg, Virginia, and in 1941 at the Medical College of Virginia, Richmond, Virginia.

E. C. L. MILLER,
Secretary

THE KENTUCKY ACADEMY OF SCIENCE

THE twenty-sixth annual meeting of the Kentucky Academy of Science was held at Murray State Teachers College, Murray, Ky., on April 28 and 29. The principal address, on "Science and Human Mores," was given by the president, Dr. W. R. Allen.

Fifty-four papers were presented in six divisional meetings. Two divisions, the Kentucky Association of Physics Teachers and the Louisville Astronomical Society, met in joint session. A feature attraction at one of the two meetings of the Division of Biological Sciences was the color film showing "Animal Life in the Kentucky Mountains," made and given by W. A. Welter, of Morehead, Ky.

An annual cash award of $50.00 for five successive years has been placed at the disposal of the academy by Mr. and Mrs. Fain W. King, Wickliffe, Ky. This award is to go to the individual presenting the best and most original paper at the annual meeting. The recipient of the award for 1939 remains to be determined.

On Saturday, April 29, after a final general session at Murray, the academy was the guest of Mr. and Mrs. Fain King, at the "Ancient Buried City" at Wickliffe. This is an excavation of Moundbuilder ruins and burials on a bluff overlooking the Mississippi.

Newly elected officers for 1939–1940 are: *President,* A. W. Homberger, University of Louisville; *Vice-President,* Chas. Hire, Murray State Teachers College. Reelected were: *Secretary,* Alfred Brauer, University of Kentucky; *Treasurer,* Wm. J. Moore, Eastern Teachers College; *Representative* of American Association for the Advancement of Science on Council, A. R. Middleton, Louisville. *Councilor to Junior Academy,* Anna A. Schnieb, Richmond.

ALFRED BRAUER,
Secretary

SPECIAL ARTICLES

THE EFFECT OF CERTAIN CHEMICALS ON THE HATCHING OF MOSQUITO EGGS

IN a study of the factors affecting the hatching of mosquito eggs it was found that only 2 per cent. of the eggs of *Aedes vexans* Meig. and *Aedes aldrichi* Dyar and Knab would hatch when flooded with unmodified tap water or with water from the Columbia River. Since eggs of these species deposited on the soil among fallen leaves and grass of cottonwood and willow flats bordering the Columbia River hatch readily when these areas are flooded, it was thought that certain chemicals dissolved from vegetation might provide the necessary stimulus.

Experiments conducted to verify this idea showed that tap-water infusions of dry cottonwood leaves, willow leaves and grass gave consistently larger hatches than either tap or river water alone. Fallen leaves 3 to 6 months old which had dried at room temperature were used in making the infusions. The leaves were strained out with a coarse cloth before the liquid was applied to the eggs. Infusions made with green leaves also caused hatching. Eggs gathered in August and flooded with 2-hour infusions representing 2 or 3 milligrams of leaves per cubic centimeter produced the largest hatches. The egg-hatching stimulant was present in these infusions in small quantities within 10 minutes after the leaves were flooded at room temperature and reached its most effective strength in from 1 to 2 hours.

More extensive tests were made with eggs gathered