SOCIETIES AND ACADEMIES

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 626th regular meeting was held January 5, 1907, with President Hayford in the chair.

The first paper of the evening was presented by Mr. L. W. Austin, describing some recent developments of wireless telegraphy and giving a comparison of the efficiency of continuous and broken wave trains in wireless signaling.

The experiments were carried on at the wireless station at Brant Rock, Mass., during the past autumn, the distance between the two antennæ being about three miles. The continuous wave trains were produced by a small Fessenden high frequency dynamo which during the experiments was run at 50,000 cycles per second. The broken wave trains were of the same frequency and produced by a spark in the usual manner. The receiver used was of the electrolytic type. Below are given the data of one of the experiments:

	Machine	Spark	
Energy	50 watts	225 watts	
Current in sending antenna	1.6 amp.	0.9 amp.	
Strength of signal	5	20	in arbitrary units
Current in receiving antennæ	2.2	4.5	in arbitrary units

the loudness of the signal being proportional to the square of the received current. If we reduce the received current to terms of the same radiation current, the spark would give 3.6 times as strong received current as the machine. Reduced to terms of the same energy the two are nearly equal in efficiency, the advantage being slightly in favor of the machine.

Mr. O. B. French spoke of 'The Recent Use of Invar Tapes for the Measurement of Primary Bases.'

Since the discovery of the alloy of nickel and steel (called invar, from invariable) which possesses a very small coefficient of expansion, its use for precise measuring apparatus has been tested very carefully. Most of these investigations have been made under the direction of C. E. Guillaume, of the International Bureau of Weights and Measures at Paris. His experiments having proved the metal to be fairly stable, the Coast and Geodetic Survey decided to try it for the measurement of primary base lines.

In December, 1905, the survey purchased from J. Agar Baugh, London, England, several ribbons of the invar tapes, 6.3 mm. in width, 0.5 mm. in thickness and 53 meters in length, which were prepared for measuring tapes in the instrument division of the survey.

During 1906 the survey measured six base lines, using on each base three invar tapes, in daylight (standardized at the National Bureau of Standards) and also three steel tapes, at night (standardized in the field).

Several pieces of the invar tapes, tested at the Bureau of Standards, showed a tensile strength of 100,000 pounds per square inch (about one half that of steel tapes), with the elastic yield point about 70 per cent. of the tensile strength.

The tapes were tested for considerable ranges of temperature, reeled and unreeled a large number of times, and also tested for continued application and removal of light loads, without showing any change in length. The coefficient of expansion of the invar tapes was found to be .0000004 per degree centigrade or 1/28 that of steel.

The steel and invar measures of the six bases were computed independently. The differences between them are small, the largest being 1:300,000 (3 mm. per km.) and the average about 1:500,000.

The probable errors of the lengths of the bases from the steel measures are more than double those from the invar measures. The final probable errors of the bases, giving the invar double weight, are between 1:2,500,000, and 1:5,000,000 (0.4 mm. and 0.2 mm. per km.).

In 1900 the Coast and Geodetic Survey demonstrated that steel tapes gave practically the same accuracy as bar apparatus with one third of the cost. It is now shown that the invar tapes give results considerably more accurate and economical than the steel tapes.

Mr. W. P. White then made some informal remarks upon 'Suspended Galvanometer Sup-

ports,' stating that the more rapid movement of the Julius suspensions and similar supports, probably on account of the rapidity, does not perceptibly affect ordinary moving coil galvanometers; hence for such galvanometers placing at the center of gravity, etc., is usually unnecessary, and the supports for such galvanometers may be given great simplicity and wide variety.

The effectiveness of a suspended support can easily be shown to be less for slower movements of the building; hence for a double reason these slower motions constitute the chief difficulty with the moving coil galvanometer.

By hanging one support from another, each provided with its own damping arrangements, a considerable gain in efficiency can be shown theoretically. This has not yet been thoroughly tested experimentally.

R. L. Faris,
Secretary

THE BIOLOGICAL SOCIETY OF WASHINGTON

The 27th annual and 422d regular meeting was held December 15, 1906. The following officers were elected for the ensuing year:

President—Leonhard Stejneger.

Vice-presidents—T. S. Palmer, W. P. Hay, E. L. Greene, E. W. Nelson.

Recording Secretary—M. C. Marsh.

Corresponding Secretary—W. H. Osgood.

Treasurer—Hugh M. Smith.

Councilors—A. D. Hopkins, J. N. Rose, A. K. Fisher, A. B. Baker, David White.

President Stejneger was nominated as a vice-president of the Washington Academy of Sciences.

The 423d regular meeting was held January 12, 1907, President Stejneger in the chair and forty persons present.

Mr. Maxon exhibited a nest made apparently by a mouse chiefly from horse hair. The nest was found upon the ground near Oneida, N. Y. Mr. Bailey said the locality of the specimen made it remarkable. The harvest mouse weaves nests of this type, using similar fine material, but Washington is the northern limit of distribution of the species. Dr. H. M. Smith noted the late autumnal flowering (November 10, 1906) of the bluet, *Houstonia cærulea,* an early spring species. Mr. Morris observed on November 15 a late flowering of *Phlox subulata,* and Mr. Clark on January 6 saw the early flowers of the skunk cabbage and the latest of the witch hazel.

Dr. Smith commented on the death on December 16, 1906, of Captain Z. L. Tanner, retired, a naval officer prominent in marine research as commander for many years of the *Albatross* on both coasts, in which capacity he has rendered great service to science.

Mr. Van Deman exhibited specimens of the Grimes apple and remarked upon the superiority of this variety. Mr. Titcomb showed an interesting anomaly in a frog which had an additional pair of hind legs. A radiograph of the specimen was shown.

Mr. M. B. Waite presented the first paper of the evening on 'A New Peach Blight from California.' The speaker stated that this peach blight was not entirely new, it having been described by Beijerinck. Pierce, in his bulletin on peach leaf-curl noted the presence of a winter blight on the peach, which, he stated, 'is probably induced by a *Coryneum.*' He mentioned the gumming habit as similar to that of *Coryneum Beyerinckii.*

The disease has evidently been in California for several years, but during the last three or four years it has increased to alarming proportions in the great interior valley of California and in the adjacent smaller districts. Especially in the more humid sections has it seriously crippled the peach industry, cutting down the production of some of the most profitable orchards to less than one half, or even a quarter, of a crop.

While in California investigating pear-blight, the writer was appealed to by peach growers for assistance. When this disease was thus submitted to him, early in February, 1905, it was easy, on microscopic examination, to promptly identify it as produced by the gumming fungus of Beijerinck, *Coryneum Beyerinckii* Oud., the writer having become familiar with the disease in 1898 through specimens sent in from Clyde, Ohio. It was known to occur occasionally in other eastern peach-growing sections. It had not attracted attention, however, as a serious disease until this

recent outbreak in California. The next day, after identifying the fungus, in the orchards at Suisun, Cal., the serious character of the outbreak of this disease became evident. All over the one-year twigs of the peach trees the small spots of the fungus were apparent. Many of the spots were necrotic and exuded gum at that early date. Scarcely an inch of the sound twig growth but carried one or more spots. Furthermore, the fungus had attacked the buds and killed and ruined by far the larger proportion of them, in many cases from 90 to 95 per cent. were already dead. On jarring the trees a shower of these dead buds fell to the ground, others were glued fast to the twigs by the gummy exudate. As the season advanced and the buds opened into blossoms the scarcity of the latter became more and more apparent. The spots on the twigs and the diseased buds exuded drops of gum which frequently ran down the twigs or dropped to the ground.

Spraying with Bordeaux mixture was at once suggested as a promising remedy, but the writer was informed that this had been tried and had proved to be a failure. Upon further questioning and an examination of the sprayed trees it was found that the treatment had been made some two weeks before, while the spots were in many cases older. The suggestion was then immediately made that spraying would have to be done in the fall or early winter, considerably ahead of the first appearance of the new infections.

This proved to be the key to the treatment of the disease. Three growers at Suisun, J. S. Brown, Geo. Reed and J. S. Chadbourne, sprayed blocks of trees in December, 1905, with Bordeaux mixture; in one case where the disease had been unusually severe the year before the trees had been sprayed a second time about January 15, 1906. Upon examining them late in March there was to be found scarcely a single diseased bud upon the sprayed trees, and where one was found, it was on a twig not reached by the spray. The contrast between the sprayed and unsprayed trees was very striking, the disease being even more severe in 1906 than in previous years. I was informed that the good results became even more noticeable as the fruit was harvested, immense crops of fine fruit being picked from the treated blocks, while adjacent orchards, often of the same variety, separated only by a wire fence, were practically failures. The crop of fruit in one case where the trees had been thoroughly treated, reached 42 tons from 100 trees, and in another case 400 trees yielded 100 tons of fruit, and similar productiveness occurred with other varieties.

The disease scarcely ever kills the tree, except possibly a young one, but it kills a great many of the branches, cripples the tree and ruins its productiveness.

Further experiments are in progress this year, beginning early in November, 1906, to test more definitely the most desirable dates for spraying, number of treatments, strength of Bordeaux mixture and the possibilities of using other sprays, especially the lime-sulphur preparation. This lime-sulphur spraying is done quite regularly in many California orchards, as well as in certain sections of the eastern states to prevent the San Jose scale. If this spray proves effective it may only be necessary to change the date from late winter or early spring to fall or early winter and thus prevent both the scale and the peach blight.

This *Coryneum* occurs not only on the peach, but is seriously injurious on the almond and apricot as well in California. It is known to be an important factor in most of the recent failures in the productiveness of these orchards. Experiments are also in progress in the treatment of the disease on these fruits.

In answer to a question, Mr. Waite said there was little doubt that the blight existed in Oregon and Washington, though it had not been definitely observed.

The second paper, by Mr. John W. Titcomb, was entitled 'Some Work of the Beaver.' While engaged in field work Mr. Titcomb visited Maskinonge County in the province of Quebec and during the month of June discovered on Lake Madam Henry a series of four freshly-built beaver dams. The upper one raised the lake some two and a half to three feet, overflowing quite a large area of lowland at the head of the lake where the

beavers proceeded to cut down poplar trees, and two months later from these cuttings had constructed a house on one side of the lake midway between the overflowed land and the dam.

Views were shown of the dam, including one showing the methods of the Indians in trapping beavers (unlawfully), of the house as it appears from the lake and also from the shore, and of the house together with a pile of cuttings for the winter's supply. Several views were also shown of the work of the beaver in the overflowed land. A view was also presented of a beaver dam on another lake about 100 miles distant from Madam Henry which practically divided the lake into two parts, the water level of one half being raised considerably above that of the other half. Incidentally a view was shown of beavers at work, a picture taken in the daytime by Mr. W. E. Balch, which was awarded first prize by *Recreation*. The award was afterward withdrawn, because it was charged that the beavers had been killed and fastened into position before the photograph was taken.

In the discussion following Mr. Titcomb referred to the unreasoning methods of the beaver, citing their apparent inability to control the direction in which the tree should fall, this apparently depending on chance. Trees felled are often found unused and with the limbs uncut, owing to their unfavorable position. The beaver frequently cuts in two a stick it is dragging, in order to get it over a log, instead of going around. Dr. Hopkins related an instance occurring in Maine in which beavers had attacked a man-made dam which had backed water into their own works. They had confined their assaults to the braces, which were considerably gnawed, leaving untouched the posts and sills. A guard became necessary until the beavers gave up their attempt.

Dr. Evermann called attention to a study of a large number of beaver dams from an engineering standpoint by Mr. Edward R. Warren, of Colorado Springs. The general conclusion reached was that beavers show little engineering sense in their construction work.

Mr. Vernon Bailey offered the third paper, on 'The Mountain Haymakers or Pikas' (Ochotona), little animals related to both the rabbit and the guinea-pig, sometimes called cony, pika, little chief hare, maginty rabbit, or maginty. The paper was illustrated with lantern slides.

The ochotonas live among the rocks, high up in the mountains, mainly near timber-line, from New Mexico and California to Alaska, and while often abundant are comparatively little known. They are approximately of the size and form of the guinea-pig, with rounded ears, short legs, and no visible tail. Their call or alarm note is a nasal squeak somewhat resembling the bleat of a very young lamb.

During late summer and the short autumn these little animals are busy gathering their winter store of hay, including plants of many species that they cut and stack in dry places under the shelter of broken rocks that lie in masses on the steep mountain slopes. Often a bushel or more of well-cured vegetation is gathered into one of these sheltered deposits and a dozen or more stacks are sometimes found within the area of a not very extensive rock slide. Almost every plant within reach is gathered, with apparently little specific discrimination. In one place on the side of Pecos Baldy in New Mexico 34 species of plants were recognized in the hay, including 9 species of grass, a sedge, two species of clover, part of a large thistle, flowers and stems of the blue columbine, a purple *Pentstemon*, a little sour-dock, a saxifrage, a *Polygonum*, a larkspur, two species of *Potentilla*, a *Geum*, *Senicio*, *Erigeron*, *Wyethia*, *Aster*, *Achillea*, *Caltha*, *Veratrum*, *Geranium*, two umbellifers, a *Silene* and an *Aralia*. Many additional species of plants have been noted in other localities and the hay often contains numerous dried flowers and some berries.

Nothing is known of the habits of these animals in winter when they and their haystacks are buried deep under the snow except that in spring the haystacks are found reduced to a few dry sticks and stems and the ochotonas seem to have survived the arctic winter in good condition.

While too small to be counted as game, these little animals serve a worthy purpose in add-

ing a feature of great interest to the upper slopes of the mountains.

In reply to a question, Mr. Bailey said the cony of the Bible was a *Hyrax*. Dr. Gill said the cony of old England was the rabbit and that the biblical scholars, mistakenly supposing the animal referred to was a rabbit, used the term cony in translating. The genus is now called *Procavia* instead of *Hyrax*. Both of the scientific names are also misapplications, the hyrax of the ancient Greeks being a shrew mouse and the biblical cony or daman being in no wise related to a *Cavia*. However, *Procavia* it must remain; the genus is the type of a very distinct family—Procaviidæ—as well as of a peculiar suborder.

M. C. MARSH,
Recording Secretary

THE ELISHA MITCHELL SOCIETY OF THE UNIVERSITY OF NORTH CAROLINA

THE 169th meeting was held in the main lecture room of Chemistry Hall, Tuesday January 15, 7:30 P.M., with the following program:

PROFESSOR H. V. WILSON: 'The Regenerative Power of Sponges.'

PROFESSOR J. W. GORE: (1) 'Direct Current Transmission of Power,' (2) 'The Electrical Aging of Flour.'

A. S. WHEELER,
Recording Secretary

DISCUSSION AND CORRESPONDENCE

THE GEOGRAPHIC BOARD OF CANADA

THE Geographic Board of Canada, organized in 1898 with aim, constitution and publications very like those of the older United States Board on Geographic Names, has just published its sixth report. As I have an interest in all matters pertaining to the geography of New Brunswick, I wish to make some comments upon the decisions of the board affecting that province.

The first duty for which the board was organized is to decide upon 'all questions concerning geographic names in the Dominion,' and its decisions up to the present are in the report before us. The great majority of these, so far as the province of New Brunswick is concerned, are admirable; but some of them, in my opinion, are quite indefensible. Thus, an important old English settlement in the province is called *Point de Bute,* sometimes printed *Pointe de Bute.* The board, called upon to decide between Point and Pointe, rejects the whole name and decides upon *Pont à Buot,* on the ground, as it has explained, that this is the original historic form of the name. Aside from the fact that this origin is only supposed and is not proved, the French form has not once been used since the English replaced the French in 1755; yet these English-speaking people are expected by the board to abandon their usage of a century and a half and adopt a form which is not only to them wholly new, but also very difficult to pronounce. Again, there is a small river and settlement which appear upon maps and in local newspapers, etc., variously as *Canouse, Canoos* and *Canoose,* the last being the commonest form and expressing exactly its local pronunciation. The board, called upon to choose between these forms, rejects them all, and decides upon an entirely new form, *Kanus,* explaining, in answer to inquiries, that this conforms to the Royal Geographical Society's rules for native names. Aside from the question as to the wisdom of changing century-old and locally-familiar words to newly-invented and strange ones to make them fit with a set of rules designed for a very different purpose, there is in this case the practical trouble that the board's form implies an erroneous pronunciation; for certainly most strangers, reading the form Kanus, would throw the accent on the first syllable and sound the a long, the exact reverse of local usage in both cases. Again, the board, very properly eliding the final possessive s in all cases of divided usage, extends this principle to cases where there is no local diversity. Thus an important bay and settlement are called *Maces Bay,* and a river and settlement are called *Cains River,* and those forms are locally invariable. Yet the board selects them for change and decides upon *Mace Bay* and *Cain River,* forms not only strange to New Brunswick ears, but, as they