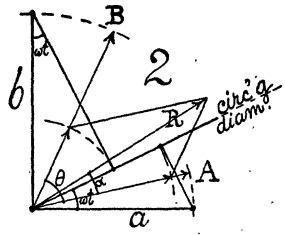
cos ωt and $y' = x \sin \omega t = (a/2) \sin 2\omega t$, the new circulating point runs with twice the original angular speed, and half the amplitude. Now suppose the amplitudes a and b in figure 2 are at right angles, and



have a common circulating diameter. Their foot points from the ends of a and b will lie on little circles of reference with diameters a and b and at distances a cos ωt and b sin ωt from the center of the common circulating diameter.

Finally let A and B be any two given vectors of length a and b. Lay off the segments just obtained along the directions A and B, and let R be their sum. Then $R = A \cos \omega t + B \sin \omega t$ the familiar ellipse, selecting A and B as conjugate radii. The relation of the angles ωt and α which begin together, and the constant ϑ (see figure) though easily found, is naturally complicated; but it is usually of no interest.

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OCCURRENCE OF A MUTANT MEADOW-MOUSE

WHILE trapping for rodents along the roadside on the outskirts of Ann Arbor, Michigan, an adult female meadow-mouse, *Microtus pennsylvanicus pennsylvanicus*, with marked color differentiation, was captured alive on October 30, 1927. The roadside here slopes gradually to a natural depression, the sides of which are covered with uncut red clover and where Microtus runways are common. The mouse was captured not more than twenty feet from the concrete road. Compared with Ridgway's color chart, the color of the pelage is as follows: back and sides, drab-gray at the tips of the hairs and white at the bases; belly, pale smoke-gray; nose and extending up between and slightly above the eyes, drab; dorsal streak on tail, hair, brown. The eye-color was red. Unfortunately the mouse died on December 16, 1927, curtailing any chance of breeding. It is now preserved as a specimen in the mammalian collection of the University of Michigan.

The authors are indebted to Dr. H. W. Feldman for the following notes concerning the possible genetic constitution of this mutant:

The color-pattern is unmistakably agouti and compared with other mutant forms of murine rodents, the specimen bears a close similarity to the albino allelomorphs. It seems to indicate a condition midway between the ruby-eyed variety of the Norway rat, *Rattus norvegicus* (as described by Whiting and King[1]), and the extreme dilution of the house-mouse, *Mus musculus* (as found by Detlefsen[2]). If the differences in the normal intensity of the pelage coloration of the meadow-mouse are considered, this mutant represents a deviation as great for the former species as extreme dilution does for the latter. Since albino meadow-mice have been noted by Dunn,[3] the albino series in this form probably consists of at least three allelomorphs.

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NOTES ON THE OCCURRENCE OF SARCOCYSTIS

RECENTLY in the preparation of histological sections of muscle, we encountered two cases of parasitic infestation, which seem worth recording. The parasites appear to belong to the order Sarcosporidia, genus Sarcocystis. Wenyon[1] in his "Protozoology" discusses this order with other groups under the heading, "Parasites of Undetermined Position." The members of the genus Sarcocystis, as the name indicates, share the common characteristic of forming, in one stage of the life cycle, cysts within the fibers of skeletal and cardiac muscle. Within the typical cysts are found the characteristic "banana-shaped" spores. Considerable variation has been reported in the sizes of both the cysts and the spores.

In one of our cases cysts of this parasite occur in the heart-muscle of the ox. The preparations were made especially for the study of the Purkinje fibers, and the parasites are found within these as well as within the ordinary cardiac muscle-fibers. Large normal cardiac fibers measure 36 micra in diameter. The smallest cyst which we have observed in such fibers measures 36 micra. Another in oblique section measures 89 by 440 micra and the largest 105 micra in cross-section, in which latter case no definite remains of the muscle-fiber can be made out. Strands of the syncytium of Purkinje fibers measure from 36 to 240

[1] Whiting, P. W., and King, Helen Dean, 1918, "Ruby-eyed Dilution, a Third Allelomorph in the Albino Series of the Rat." *Jour. Exp. Zool.* 26: 55–64.

[2] Detlefsen, J. A., 1921. "A New Mutation in the House-mouse." *Amer. Nat.* 55: 469–473.

[3] Dunn, L. C., 1921. "Unit Character Variation in Rodents." *Jour. Mamm.*, vol. 2: no. 3: 125–140.

[1] Wenyon, C. M., 1926, "Protozoology," Vol. I, pp. 760–769.

micra in diameter. In a Purkinje fiber of the moderator band a cyst occurs which measures 170 micra. There are cysts in the fibers of the bundle of His ranging in diameter from 60 to 234 micra.

In the second case the cysts are found in the pectoralis major muscle of the turkey-buzzard. Fibers of this muscle measure 56 micra in diameter. Sections of three cysts measure, respectively, 52, 57 and 65 micra. Sections of the buzzard's heart were prepared and studied, but no cysts were found.

The spores within the cysts of the beef-heart measure 3 to 4 micra in diameter and 16 to 18 micra in length. Those in the buzzard measure 2 by 9 micra. In both the beef-heart and the buzzard-muscle the fibers adjacent to those containing cysts appear perfectly normal. Neither is there any connective-tissue-reaction to the presence of the cysts.

Although these parasites have been repeatedly described in the hearts of various species,[2] we have not found specific mention of their occurrence in the Purkinje fibers. Wenyon tabulates thirty-five species of Sarcocystis with four additional cases in which the species were not named. We have found no mention of these parasites occurring in the turkey-buzzard, either in the general literature or in Wenyon's book, although he lists nine other species of birds in which they have been found. The finding of these parasites in the buzzard is interesting in view of Crawley's statement[3] that "whereas the purely herbivorous cattle are practically invariably infected, records of the finding of sarcosporidian cysts in the muscles of carnivorous animals are very rare."

Alexeieff,[4] who studied these forms extensively, concluded that there is no means of telling what the species may be, and that, in spite of variations in size, all belong to the same species. Hence, we merely record that we found Sarcocystis sp. as described above in the Purkinje fibers of the beef-heart and in the skeletal muscle of the turkey-buzzard (*Carthartes aura septentrionalis*).

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[2] Manifold, J. A., 1924–25, "A Case of Human Sarcosporidiosis." Trans. Roy. Soc. Trop. Med. & Hyg., London, xviii.

Hadwen, S., 1922, "Cyst-forming Protozoa in Reindeer and Caribou and a Sarcosporidian Parasite of the Seal (Phoca richardi)." *J. Am. Vet. M. Assn.*, Vol. lxi.

[3] Crawley, H., 1916, "The Zoological Position of the Sarcosporidia," Proc. Acad. Nat. Sc., Phila., Vol. lxviii.

[4] Alexeieff, A., 1913, "Recherches sur les Sarcospiridies." Arch. de Zool. exp. et gen., li, pp. 521–569.

QUAILS, POTATO-BUGS AND OTHER THINGS

HERE in Beaufort, S. C., there are many potato-bugs and quails. It may not be generally known that quails eat potato-bugs. Even ducks and guineas refuse to eat them. The potato-bug seems to have very few enemies.

Quails here. eat acorns—scrub-oak and live-oak acorns. The agricultural department at Washington told me some time ago that they did not know of a live-oak strain carrying sweet acorns. There are three of these trees in Allen Park, Augusta, Ga., and I know one here on the Harvey place. The acorn is as sweet as the meat of a chinquapin, and by the way these chinquapin trees grow here thirty feet high and have bushels of chinquapins on them.

Another interesting tree which grows wild here is the Chinese tallow. Chickens fly up into the tree to eat these quite edible seeds. When the pods have burst and an oily seed is placed on a live coal it sends up a white flame six or eight inches high which burns steadily for three or four minutes.

In the up-country the *Magnolia grandiflora* is an ornamental lawn-tree. Down here it is a regular forest-tree only, with diameter of three or four feet and grows along with slash pine and live-oak in the forest.

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THE EARLIEST DYNAMO

I NOTE in your issue of April 13 a notice of the approaching fiftieth anniversary of the invention of the dynamo. I desire to call your attention to the fact that in the Centennial Exposition of 1876 there were two dynamos on exhibition known as the Gramme Dynamo. These machines were made in Paris. At the close of the exposition, Professor Barker, of the University of Pennsylvania, bought the larger of these machines and I bought the smaller one for the young institution of learning, Purdue University. Following the close of the exposition my Gramme machine was sent to Lafayette and installed in the chemical laboratory. I also built a lamp which was very successful, mounted it in the cupola of the university and illuminated the city of Lafayette late in November with the first electric light ever shown west of the Alleghenies and generated by a dynamo. This machine remained in use in the physical and chemical laboratory of Purdue University up to a recent date, and is still in an excellent condition. It has now been installed in the museum of Purdue, properly labeled with the data