Further tests are in progress in order to determine the earliest age at which these differences in ascorbic acid content of the leaves or other non-fruit parts of the plant are detectable. If the method proves successful and adaptable to other fruits and vegetables, it will make possible a "vitamin sieve" to precede all other tests of adaptability, winter hardiness, consumer preference and trade demands.

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DETERMINATION OF THE CHLOROPLAST PIGMENTS OF PLANTS

THERE is considerable evidence at hand on the possible relationship of the chloroplast pigments, especially the carotinoids, to sexual reproduction in plants.[1] To minimize discouragement in this type of study[2] and the drawing of premature conclusions one should exercise particular care in methods of determination of the carotinoids, a significant percentage of which may be lost in the process of extraction and purification. Of even greater importance is the selection of proper material for the quantitative analysis of these pigments. Carotene, for instance, seems to increase in concentration (Murneek—soybean leaves) and in quantity (Virtanen *et al.*—peas and wheat) till the time of flowering and early fruit setting and then decreases rapidly. Hence the mere determination of these pigments in "fruiting" and "vegetative" plants loses significance, unless their developmental states are carefully correlated with the analytical assay. In fact, at certain stages of growth the fruiting plants may have less carotene than the non-fruiting ones.

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VERTEBRATE LOCALITIES IN SOUTH PARK, COLORADO

DURING the past three summers we have been cooperatively engaged in a geological study of South Park, Colorado. This project was financed at first by grants from Northwestern University and from anonymous contributors, and brought to a successful conclusion, thanks to a grant from the Geological Society of America. With the permission of the society, the following brief account is published as of interest to stratigraphers and especially to vertebrate paleontologists.

The basin of South Park has been the site of subaerial and fresh-water deposition at various times since the Laramide Revolution. There are four localities where we have found fragmentary but identifiable vertebrate remains. Since, for lack of time, only short periods (a day or less in any one place) were devoted to search, there is reason to believe that any of these localities may yield better remains when more carefully examined.

Three of these localities appear to represent beds of White River age and are in what we have tentatively designated the Antero beds. In the southwest quarter, section 33, T. 12 S., R. 76 W., tuffaceous beds above a conglomerate bore fragments of a tooth identified by Mr. C. W. Gilmore, of the National Museum, as that of a titanothere or possibly uintathere of Oligocene or late Eocene age. In the southwest quarter, section 8, T. 14 S., R. 75 W., is a cut exposing fine tuff and gritty, blocky clays, mostly white to light gray in color, which aggregate about 120 feet in thickness; from these beds teeth, skull bones and limb bones were collected, representing six mammalian forms and pronounced by Mr. C. L. Gazin, of the National Museum, to be of White River (Oligocene) age. About a mile east of the Fairplay-Antero Junction highway in section 22, T. 10 S., R. 77 W., on the east side of a flat-topped ridge, white tuff beds are capped by pinkish sandy clays with local conglomeratic layers. From the pink beds several small fragmentary jaws and teeth were collected, representing chiefly insectivores, marsupials and artiodactyls, and referred by Mr. Gazin to White River age.

Immediately south of the park, on the divide separating South Park from Wagon Tongue Creek, in sections 31 and 32, T. 14 S., R. 75 W., gravelly and clayey beds, having a thickness of about 250 feet and tentatively called by us the Wagontongue beds, are well exposed in two northward-facing cuts. From the eastern exposure one jaw representing an Equid was collected and on this basis Mr. Gazin referred the beds to the upper Miocene or Pliocene.

The collections from these localities have so far been given tentative study only, but faunal lists are available. Our project does not include further collecting in the near future. We publish this note in the hope that others may find it possible to devote more time to search for fossils in the places listed. All except the last are readily accessible by secondary roads. If

[1] S. Satina and A. F. Blakeslee, *Proc. Nat. Acad. Sci.*, 12: 191–196 and 197–202, 1926. R. Chodat and W. H. Schopfer, *Comptes Rendus Soc. Phys. et Hist. Nat.*, 44: 176–179, 1927. M. Cajlahjan, *Comptes Rendus Acad. Sci. U. S. S. R.*, 1: 1:40–42, 1932. A. T. Virtanen *et al.*, *Biochem. Zeitschr.*, 267– 1–3: 179–191, 1933. A. E. Murneek, SCIENCE, 79: 528, 1934.

[2] SCIENCE, 82: 596, 1935.

further particulars are wanted the undersigned will be glad to supply them.

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OCCURRENCE OF THE MALONE AND TORCER FAUNAS AT THE BASE OF THE ARIZONA COMANCHEAN

THE stratigraphic problems associated with the interpretation of the Upper Jurassic–Lower Cretaceous sequence of the Malone district in Texas are well known. Briefly summarized, in 1905 Cragin described as the "Malone formation" strata near Malone, Texas, that contain ammonites and lamellibranchs.[1] He interpreted the entire assemblage of the Malone fossils as belonging to the Upper Jurassic. The Jurassic (Kimmeridgian) age of the Malone ammonites, collected by Cragin, was upheld by V. Uhlig and later by L. F. Spath. In 1926 F. L. Kitchin demonstrated that the *Trigoniae* described by Cragin could not be of earlier age than Valanginian (earliest Cretaceous) and emphasized that there was no proof that all of Cragin's fossils came from a single horizon.[2]

W. S. Adkins, therefore, restricted the term Malone to the Jurassic part of the section of central Malone Mountain near Torcer station on the Southern Pacific Railway west of Sierra Blanca, and introduced the name Torcer for the Cretaceous (Neocomian) portion of Cragin's "Malone formation."[3]

In the lower part of the Cretaceous sequence near Bisbee, Arizona, there are limestone beds that contain abundantly represented and well preserved specimens of *Trigonia vyschetzkii* Cragin, *Trigonia calderoni* (Castillo and Aguilera), *Trigonia goodelli* Cragin, *Trigonia proscabra* Cragin, *Pleuromya inconstans* Castillo and Aguilera, *Astarte* (*Eriphyla*) *malonensis* Cragin, *Exogyra potosina* Castillo and Aguilera and other lamellibranchs described by Cragin from the Malone area. The conditions of deposition apparently were the same as at Malone, and forms referred by Cragin to *Astrocoenia* and *Serpula* are found in abundance. Immediately above these limestone beds are cross-bedded sandstones and fresh-water-laid sandstones with large silicified tree logs. In the younger argillaceous limestones *Dufrenoya texana* Burckhardt, marking the Upper Aptian (Travis Peak), is found.

About 500 feet below the Trigonia beds are grits alternating with sandstones and impure limestones. The grits yield *Idoceras schucherti* (Cragin) which demonstrates the Kimmeridgian (early Upper Jurassic) age of these strata.

A detailed account of this find will be published in the near future.

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SCIENTIFIC BOOKS

ANATOMY OF VERTEBRATES

The Microscopic Anatomy of Vertebrates. By G. G. SCOTT and J. I. KENDALL. 306 pp., 167 figs. Lea and Febiger, Philadelphia, 1935.

THIS is an elementary treatise on vertebrate histology that is designed to fit a college course one semester in length. For this reason the descriptions have been kept brief and relatively simple, although by judicious elimination of minor detail and justifiably dogmatic presentation a surprisingly large amount of information is made accessible. The style is clear and readable and the arrangement of text-matter logical. There is an adequate index.

The illustrations, mostly original, are partly unlabelled photomicrographs and partly line drawings. The former are rather good in comparison to the natural limitations of this ideally desirable but practically disappointing medium. The line drawings make no pretense toward the faithful portrayal of cell, tissue or organ structure but exist as diagrams which serve in a stylized way as keys to what might be found in actual preparations. No magnifications are given, since the authors believe college students incapable of comprehending such magnitudes. To the reviewer this seems a definite shortcoming and a palpable libel on collegiate intelligence. But even admitting that a college student can not visualize what is implied in an illustration being enlarged 10, 100 or 1,000 times the original size, it still is true that such information allows one to judge of relative size by knowing that certain drawings were made in the ratio of 200 to 400 units, and so on. Nevertheless, the authors state that the student constantly using the microscope will have little difficulty in appraising the degree of magnification and that he can measure things mentally by the familiar artifice of using the erythrocyte as a yardstick. One wonders, however, if escape has not been made from one difficulty into worse ones. The degree of magnification, as judged by the eye, is something like stating the apparent size of the moon, while the correct sensing of the absolute value of the micron is probably harder than understanding magnification values. Moreover, in a comparative course the verte-

[1] F. W. Cragin, "Paleontology of the Malone Jurassic Formation of Texas," U. S. Geol. Survey Bull. 266, 1905.

[2] F. L. Kitchin, "So-called Malone Jurassic Formation in Texas," *Geological Magazine*, Vol. 63, pp. 454–469, 1926.

[3] W. S. Adkins, "The Mesozoic Systems in Texas," University of Texas Bull. 3232, pp. 286–291, 1932.