(8) The field is unencumbered by organized pure science research projects.

(9) It is a vegetation type in which ecological interest is great and much important plant ecological work has been done on the moist eastern portion of the grassland, but all animal relations and their interactions with plants have been neglected.

(10) The problems of wind and water erosion of soil and the attendant dust movement are essentially biological problems.

(11) Suitable lands are of *low* economic value.

(12) Its climate is suitable for the work of investigators.

The plans of interested scientists have called for an undisturbed check area which could be under observation for a sufficiently long period to permit an analysis of drouths and dust storms, and rodent, predator and grasshopper outbreaks that occur separated by rather long intervals such as 30 to 50 years or more.

Agricultural lands are subject to such erratic overturn that causes of cyclic phenomena can not ordinarily be followed in a scientific manner. Game preserves and other small areas are, necessarily or unnecessarily, so managed as to obscure natural phenomena and render scientific conclusions unavailable or uncertain. Students of grasshopper outbreaks and, to a lesser extent, infestations of rodents desire large areas to follow the normal population of these pest animals. The need of a large area has been voiced by many, including grasshopper specialists, whose scientific results require freedom from *marginal effects* in this migratory group. For example, a tract of a few dozen sections of land surrounded by cultivated and overgrazed areas is so completely sprinkled with windborne organisms as to render conclusion as to natural trends uncertain.

The hope is that in the not too distant future scientific men can interest government agencies and granting bodies, which have helped with such projects in the past, to cooperate in providing land and facilities for basic terrestrial biological research. For example, an endowed laboratory could be set up on land of its own for the purpose of carrying on observations continuously. Such research would include analyzing the physiology of the animals in their relation to weather and climate, studies of competition, natural selection, reproduction, hormones, etc. For example, the National Park Service is interested in setting up a Great Plains National Monument large enough to prevent domestication of plains animals and to be managed on a hands-off basis. A laboratory adjacent to such an area would have many advantages.

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OXYGEN REQUIREMENTS FOR GERMINATION OF SEEDS OF NYSSA AQUATICA—TUPELO GUM

IN the swamp forests of the southeastern United States frequently two species of trees are found to be dominants, *Nyssa aquatica* and *Taxodium distichum*. These trees have often been considered as very similar in their ecological requirements. Some time ago, 1932,[1] it was shown that *Taxodium* seeds can not be made to germinate under water, although after the seedling has attained a certain growth the roots and lower parts of the stem may be submerged indefinitely without harm. This is of interest ecologically, since it prevents the coming in of *Taxodium* in marshes that are continuously covered with water unless a dry season reduces the water to the point that the upper layers of soil become fairly dry.

So far as the writer has been able to learn, little has been known regarding the capability of seeds of *Nyssa aquatica* to germinate under water, although the trees may stand in water for indefinite periods.

The drupaceous fruits of *Nyssa aquatica* were collected in eastern North Carolina in September, 1938. They were allowed to dry and the fleshy exocarp and mesocarp tissue was removed, leaving the very hard endocarp enclosing the seed. On October 25 some of these "seeds" (endocarp plus seed) were placed in a metal cylinder containing sand, covered with water and placed out of doors at Raleigh, N. C. Similarly, a number of "seeds" were placed in a cylinder in moist sand out of doors at the same time.

On May 9, 1939, the cylinders were brought into the laboratory, and on the following day the sand containing the "seeds" was removed from the cylinders and placed in moist chambers kept in the laboratory. Those "seeds" kept moist but not flooded during the winter were kept in moist sand, and those that had been flooded were kept flooded under 3 to 4 cm of water.

When brought into the laboratory on May 9, three of the "seeds" from moist sand had already germinated. Subsequently, up to May 27 six additional "seeds" sprouted, giving a total germination in moist well-aerated sand of nine out of 21 "seeds." Up to the latter date none of the "seeds" kept flooded showed any signs of germination. Of 32 "seeds" kept flooded until May 27, sixteen were taken out on that date and placed in moist but well-aerated sand, the others kept flooded. From May 27 to June 16, eight of the "seeds" taken from the flooded container and given oxygen in moist sand germinated. None of the seeds kept flooded germinated up till the present, late July.

Since lack of aeration apparently prevents sprout-

[1] Delzie Demaree, *Ecology*, 13: 258–262, 1932.

ing of the "seeds" of *Nyssa aquatica*, it, like *Taxodium*, can not come in on an area kept constantly flooded.

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ON "A NEW COLOR REACTION FOR VITAMIN B_1 (THIAMIN, ANEURIN)"

VILLELA and Leal[1] report that pure synthetic Vitamin B_1 produces an intense blue color by the use of ammonium molybdate in sulfuric acid solution and aminonaphthosulfonic acid solution, and prescribe the quantitative method of Fiske and Subbarow, which is primarily used for phosphorus determinations.

The author was interested to ascertain if the blue color would be produced likewise when using stannous chloride as the reducing agent instead of aminonaphthosulfonic acid. Both reagents are used in phosphorus determinations by the blue color methods, and if thiamin interfered in one or both, it should be taken into account. Also since there is a distinct need for an efficient thiamin method, reports should be considered and evaluated.

By employing the stannous chloride reduction method,[2] it has now been found that thiamin (Vitamin B_1 Hydrochlor. Cryst. Merck) gives no blue color. Neither does thiamin give any blue by the Fiske and Subbarow method. Presumably, Villela and Leal[3] used thiamin chloride or hydrochloride, since no report of the isolation of the pure base has yet been made. However, by first treating thiamin chloride hydrochloride with NaOH (to produce the strong base),[4] neutralizing and immediately following with the procedure prescribed by Villela and Leal, no blue resulted. Reagents and procedure were, of course, thoroughly checked.

It is concluded that thiamin, or Vitamin B_1, does not give a blue color by the Fiske and Subbarow method nor by the stannous chloride reduction method. Thus thiamin does not interfere in phosphorus determinations. It is suggested that the blue color indicated by Villela and Leal was probably due to impurities.

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CHRONICA BOTANICA

COMMUNICATIONS from Dr. Fr. Verdoorn in November convey the information that the difficulties arising from the war situation in Europe which threatened the existence of *Chronica Botanica* have been solved.[1] It is announced that this important periodical will be published as a weekly beginning January, 1940, with the number of pages increased to 850 annually, with about 150 illustrations. Publications of all planned volumes of the "New Series of Plant Science Books," including numbers by Lloyd and Reed and H. I. Baldwin, together with the production of Volume 1, "Tree Growth" by MacDougal, will be carried out. The editor advises that urgent letters be sent by air mail and that all other mail be designated via "Holland America Line."

D. T. MACDOUGAL
F. E. LLOYD
H. S. REED

DECEMBER 5, 1939

SCIENTIFIC BOOKS

PHYSICS

Physical Science in Modern Life. By E. G. RICHARDSON. 256 pp. 16 plates. D. Van Nostrand Company, Inc. $3.00. The English Universities Press, Ltd. 8/6d.

THE publisher's blurb on the jacket is: "If you have wondered how an aeroplane flies—what constitutes a quicksand—why it is usually necessary to shake an embrocation, but not a mayonnaise—how a man can glide for four hours in an engineless aircraft—what limits clarity on a television screen and power in broadcasting stations—how a fish swims—whether we shall ever have trips to the moon—here is the book for you."

Certainly there can not be too many works that excite wonder or clarify the problems born in wonderment. The author claims to have set his back to the atom and the molecule and to have faced those recent advances which make contact with everyday existence. Perhaps his incentive came from his aunt, who was fond of lauding the advances in psychic science at the expense of those in the material world. When she asked him what physics had done for her, he replied that the tram had brought her up the hill that day. Thus he says the book might be called "tramway physics."

Perhaps beginning students and others do display glassy eyes when the conversationalist or lecturer begins by mentioning atoms, molecules, electrons, neu-

[1] Gilberto G. Villela and Aluiso M. Leal, SCIENCE, 90: 179, 1939.

[2] Guy E. Youngburg and Mamie V. Youngburg, *Jour. Lab. Clin. Med.*, 16: 158, 1930.

[3] It is to be noted that Villela and Leal use twice as much Molybdate II as Fiske and Subbarow. It made no difference, however, in this application.

[4] R. R. Williams, *Ind. Eng. Chem.*, 29: 980, 1937.

[1] Robert F. Griggs, SCIENCE, 90: 4418, November 3, 1939.