



FIG. 1. The Sudd, Upper White Nile River, Anglo-Egyptian Sudan, showing papyrus heads eaten by migratory locusts.

son. Probably in large part because of the Sudd, the White Nile, although much longer, furnishes less water to Egypt than the shorter Blue Nile from the mountains of Abyssinia.

It is the purpose of this note to call attention to the biocoenose centering about the heads of papyrus in the Sudd. The association is not only scientifically worth investigating but has economic implications because of the use of papyrus in paper-making and water conservation.

On the stems, which may be ten or more feet long, papyrus heads of two kinds are borne. One consists of flower spikelets on long stalks borne in an umbel about two feet in diameter. The other consists of an apparently sterile inflorescence of similar size. In the Sudd papyrus grows so densely that the heads touch one another. As one passes by small steambot through the Sudd for days the view is a vista endless to the horizon on every side of papyrus heads undulating with the breeze like a field of grain.

Insects and spiders in this region would be forced to nest on these floating rafts since no soil is exposed over large areas. The bases of the papyrus heads, where the numerous spikelets come together to form a dense mass one or two inches thick, offers a suitable nesting place for some.

While passing by steambot through the Sudd, July 8 to 11, 1939, I was interested in the ants brushed off from papyrus as the boat barged into the vegetation in the sharp, narrow turns and also collected spiders and other arthropods found. The ants have been determined about

as far as possible without the benefit of identified material in European collections which is now unavailable. The spiders and many other arthropods apparently are unidentifiable in this country.

The arthropod of most conspicuous importance in the biocoenose is the migratory locust (probably *Cyrtacanthacrus septemfaciata*). The enormous swarms cover many square miles and migrate for hundreds of miles. "A swarm that passed over the Red Sea in 1889 was estimated to weigh 42,850,000,000 tons and covered 2,000 square miles. Actual expenditures in South Africa for locust control in 1935 were 949,681 pounds sterling and the 1933-4 loss of crops through them over Africa was estimated at 7,000,000 pounds sterling (S. and E. African Yearbook, p. 796). While passing through the Sudd a continuous cloud of locusts passed over us July 8 from 9 to 11 A.M., their feces showering down on the boat and water like rain. The feces were of very coarse fiber, undoubtedly from papyrus, and were pale green and quite dry. During this day and on several others, especially July 5, large clouds of locusts like dense smoke were seen; several times the clouds covered a quarter or more of the horizon. The boat passed for miles through papyrus banks with the distal parts of the flower spikelets eaten down. Flocks of snowy egrets and a plain-colored brown hawk preyed on the locusts, the hawk leisurely flying through a swarm and now and then reaching out with a foot to capture one.

The following orders were taken while passing through the Sudd: