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INTRODUCING THE SAROLGA

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The sarus crane (*Grus antigone*) was first unofficially identified in Australia on 13 September 1964, by Dr. and Mrs. William Cittrell of Harvard University and Mr. James Bravery of Atherton, Australia. The cranes were observed at Hasties and Willets Swamps on the Atherton Tableland, Queensland. Unfortunately the photograph they took was not good enough to permit positive identification. It was not until 13 October 1966 that a party made up of Mrs. Gill of Innisfail, Queensland, Mr. Eric Zillman of Queensland, and Fred Smith of Victoria officially recorded sarus cranes at Normanton (Gill 1969). A photograph by Zillman was sent to Alex Chisholm of Sydney, who confirmed the identification. On 16 September 1967, Chisholm published a picture of the species in the Sydney Morning Herald.

On 27 July 1967, Mr. Jim Bravery and Mr. Bruce Cook of Marselia, Queensland, saw 23 sarus and over 80 brolgas (*Grus rubicunda*) at Willits Swamp. Included were several immature sarus (Bravery 1969). Dr. Lawrence Walkinshaw studied sarus cranes on the Atherton Tableland in 1969, and specimens were collected by Lavery and Blackman in the same area in 1970. Lavery and Blackman (1969) confirmed the form as the eastern sarus crane (*G. antigone sharpii*), a uniformly gray bird, contrasting to the white-collared and larger Indian form, the common sarus (*G. antigone antigone*). Blackman (1971) summarizes the observations of sarus cranes in Queensland as covering 880 km from Aurukum to Normanton and from Normanton along the Gulf of Carpentaria (960 km) east to Ingham on the east coast of the continent. Ridpath (pers. comm., 1972) reported that the species had unofficially been recorded in Northern Territories. Slater (1970) reports the range of the species as extending from Queensland's west to the Kimberley Plateau of Western Australia. In 1972 the author saw 2 sarus cranes near Kununurra in northeastern Western Australia and about 200 on the Atherton Tableland of Queensland.

ATHERTON TABLELAND CRANES

Cranes of the Atherton Tableland were studied from 1 November to 14 December 1972. Approximately 200 sarus and 30 brolgas were present during the 1st 2 weeks of the study. The 1st rain of the wet season came on 15 November and from then until 9 December the sarus numbers decreased as birds supposedly migrated west to the breeding grounds. From 10 to 14 December the only cranes observed on the Tableland were brolgas.

Both species roosted at Willets Swamp and on the shores of Lake Tinaroo. Generally the species roosted in loose but separate flocks. At dawn they typically unison called, preened, then flew to feeding areas on the recently plowed maize fields. Sarus and brolga usually flew and fed in separate flocks; however, it was not uncommon to see the species together. In late morning the birds either circled up the hot thermals and disappeared from view, or they flew directly to drinking areas--springs, small streams, Willets Swamp, or Lake Tinaroo. By late afternoon they usually had returned to the fields to feed and at dusk they returned to waterside roosts. From late November until they departed in December the sexual display activities of sarus increased (dancing, unison calling) both at the roosts and in the fields.

I was unable to discern any difference in habitat used by sarus and the brolgas on the Atherton Tableland. Both species had similar daily movements and fed on the same materials in the fields (corn, rats, insects) and in the marshes (sedge tubers, aquatic animals). Although no ecological difference was noted between the species, their anatomy and displays are quite divergent.

The sarus are slightly larger than the brolgas. Whereas the brolga has about 5 cm of red headcomb, the sarus comb extends from the head about 12 cm down the neck. The brolgas have a pronounced gular sac beneath the chin and the sarus have none. The brolgas are a shiny light gray, but the sarus are a dull steel gray. The brolga has a graceful stance with its long, curved neck and slender body, while the sarus is a stockier bird. The brolga's feet and legs are black, whereas those of the sarus are pink. Brolgas have a much deeper, raucous voice contrasted to the shrill, higher voice of the sarus. When dancing the brolga makes many bouncy leaps in the air; the sarus has a more graceful dance, makes long runs with wings spread, and then makes deep bows.

THE SAROLGA

Among the 200 sarus on the Atherton Tableland in 1972, there were at least 2 and possibly 6 hybrids between sarus and brolga hybrids, which for convenience will be called sarolgas. Each time a sarolga was observed it was with a small flock of apparently nonbreeding sarus (chicks were absent from the flocks). The 1st sarolga was collected and is described below. Soon after that a 2nd sarolga was observed with sarus cranes. This observation was repeated on 4 subsequent occasions. One adult bird believed to be backcross progeny from a sarolga-sarus breeding was observed and photographed with more than 100 sarus at a water hole. Once at midday a sarus female and brolga male pair were observed in company with 8 other brolgas at Willets Swamp.

The sarolgas are perhaps an example of hybrid vigor because they appear larger than even the sarus, which is larger than the brolga. Table 1 and Figure 1 present the measurements and other characteristics of the collected male sarolga, and these are compared to similar characteristics of adult male sarus and brolga. Basically the sarolga looks like a huge brolga. Sarus features were size, pink tibia, hock joints, and feet. Brolga features were notched comb, black tarsi, and the graceful brolga body conformation and plumage color. Intermediate characteristics were comb and gular sac size. Weight, tarsus, and culmen measurements exceeded those of both sarus and brolga. Other sarolgas observed appeared to have characteristics similar to the collected bird.

The supposed sarolga-sarus backcross progeny looked like a sarus except for darkened tarsi, reduced comb, and the notched comb pattern. The existence of a backcross would indicate the reproductive capability and the evolutionary potential of the sarolga.

DISCUSSION

The sarus discovery in 1964 and the apparent population increase, coupled with the 1972 discovery of

Table 1. Characteristics of male sarus, sarolga, and brolga cranes.

Characteristic	Sarus (N = 5 males)	Sarolga (N = 1 male)	Brolga (N = 4 males)
Weight (kg)	8.4	9.5	6.8
Culmen (mm)	162.3	177.8	164.4
Tarsus (mm)	296.0	317.5	304.9
Comb (mm)	127.0	107.8	508.0
Iris	Yellow	Yellow	Yellow
Comb pattern	Even	Notched	Notched
Tibia	Pink	Pink	Black
Ankle joint	Pink	Pink	Black
Tarsus	Pink	Black	Black
Feet	Pink	Pink	Black
Body conformation	Stocky	Graceful	Graceful
Plumage color	Slaty gray	Light shiny gray	Light shiny gray
Gular sac	Absent	Present but small size	Present

interbreeding with brolgas, has posed some interesting questions. Where did the sarus come from? How long have they been in Australia? What is their future there? What is the future of the brolga in relation to the presence of the sarus?

The pre-1964 range of the sarus was believed to extend from Assam to Vietnam and south to the northern parts of the Malay Peninsula--basically, southeast Asia. It is not considered a bird of the Philippines, Indonesia, and the island of New Guinea, although there are a few scattered records from the Philippines. Brolgas, or at least what are believed to be brolgas, breed in southern New Guinea. From existing evidence it seems probable that the sarus immigrated 3,480 km from southeast Asia to Cape York, Australia, in the early 1960's.

Some ornithologists argue that the sarus may have been in Australia for many years and simply went unnoticed. They reason that the sarus were considered brolgas in breeding condition because the comb is larger and brighter in the breeding season. However, northern Australia has been the site of many ornithological investigations. Surely all of these trained observers would not have confused the sarus and the brolga. My theory that the sarus recently arrived in Australia is supported by the facts that the bird was not recognized until 1964 and that they have subsequently increased at an apparently rapid rate, and their range is expanding.

Perhaps the best evidence for the recent arrival of the sarus is the presence of sarolgas. The sarus and brolgas will interbreed, and the hybrids are fertile. If the sarus had been in Australia for many decades, an observer might expect to find introgressing of the 2 species into a new crane form. Introgression was evidenced only by the possible 6 sarolgas, the 1 supposed backcross progeny of a sarolga-sarus breeding,

and the apparent pure brolga-pure sarus pair, suggesting that the reproductive barrier between these species--geographic separation--was recently broken and interbreeding was only recently possible. The fertility of the sarolga was verified in Jean Delacour's aviaries in France in 1934; sarolgas produced in captivity were fertile (Gray 1958).

The future for the sarus in Australia is bright. They are larger than the brolgas, have apparently adapted well to Australian environment, and are increasing and expanding their range. In contrast, the future of the brolga may be shadowed by the presence of the sarus. The greatest problem for sarus-brolga coexistence may be the breeding habitats. Both species nest and rear their chicks in marshlands, and pairs defend large areas of marshland as breeding territory. The unanswered questions are--Do the sarus use the same types of marshes as the brolgas, and if they do, what is the interaction between the species?

Walkinshaw (1973) observed both sarus and brolgas breeding in the Normanton area of Queensland. He relates that the sarus prefer upland prairie-like marshes, while the brolgas keep more to the low coastal marshes. This tendency is also mirrored during the nonbreeding season, when the sarus frequent more upland agricultural-type areas while the brolgas' greatest congregations are along the coastal marshes, where they subsist primarily on tubers (Blackman 1971). It appears that, at least when the sarus numbers were low, there was a niche divergence between the species. However, if their numbers continue to increase, as they apparently have been, we might expect sarus to move into less-preferred habitat--probably the brolgas' breeding marshes. Sarus are significantly larger than brolgas. It may be that they will establish dominance over the brolgas and displace them from their breeding habitats. The future for the brolga is bleak if such competition develops.

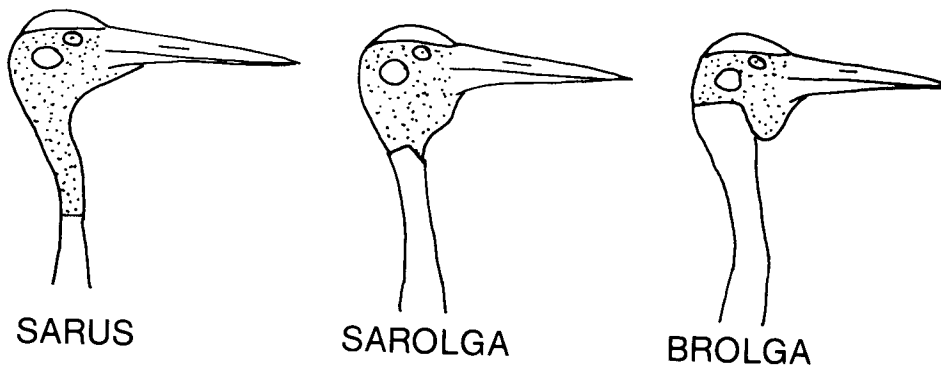


Fig. 1. Comparison of head comb (dotted areas) of sarus, sarolga, and brolga.

However, if introgressing continues at a significant rate, we can eventually expect the evolution of a type of sarolga. Divergent evolution of the 2 species to occupy distinct niches and thus avoid competition, interbreeding to a species swarm, or the eventual extinction of the brolga are all possibilities. It will be most interesting to observe future crane events in Australia.

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