

THE GREAT INDIAN RHINOCEROS

By A. N. ROY

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Until recent years, there was a two-horned rhinoceros in Malaya, but it is probably now extinct according to Theodore Hubback, who spent some considerable time looking for one. There remains in Asia, the Great Indian Rhinoceros (*R. Sondaicus*), which is also becoming very scarce but is known to exist in the Nepalese *Tera*, in the Kajiranga Sanctuary of Assam, and in the Jaldapara Sanctuary of Bengal. The latter is 36 square miles in extent, being bounded on the north by the Madarihat-Nilpara Road, on the south by the forest boundary, on the east by the Nilpara-Chilapatta Road and on the west by the forest boundary. Within this area, or in the forest adjacent to it, it was estimated that, prior to 1930, there lived about eighty rhinoceroses but in 1930 and 1931 a number of *Mechis* (also known as *Boros*) came over from the Goalpara district of Assam to join the local *Mechis* and, between them, during those two years, they murdered about 50 rhinoceroses. (In 1932 and 1933 T. V. Dent collected about fifty separate skulls.)

In 1932, thanks to the representations of L. O. Shebbeare, the Rhinoceroses Preservation Act came into being and the above area, known as the Jaldapara Game Sanctuary, was declared a special reserve for the preservation of the rhinoceroses.

The writer was made Honorary Game Warden of this reserve in 1934 and scarcely ever saw a rhinoceros until 1936. The population is now estimated at 60 and it is thought that very few are poached.

Very little is known about the rhinoceros and this sanctuary offers a unique opportunity of observation.

A large bull stands about five feet six inches at the shoulder and is about 10 feet long. The horn is about eight to 10 inches long. The female is a somewhat smaller animal and her horns are only rudimentary or, in some instances, non-existent. Both sexes are hairless

and have heavy folds of skin on the shoulders, flanks and knees which, at a distance give them that well known "armour-plated" appearance. They are apparently monogamous and pair off for life, but this needs further investigation. The gestation period is thought to be about eighteen months and cows give birth to one calf every three years. Calves are generally born in the spring and are weaned after 18 months.

Like the elephant, the rhinoceros dislikes intense heat and is worried by flies and leeches. He lies up in thick forest during the heat of the day, generally in pools under deep shade or in muddy wallows.

Their food consists mainly of tall grass, water hyacinth and other aquatic plants and their roots. They are also very fond of maize and rice and can do a considerable amount of damage to these crops just before they ripen.

The horn is apparently never used for rooting and is thought to be merely a weapon of offence and defence.

The rhinoceros has no natural enemy in the jungle with the exception of tiger. A calf has been seen which had been badly mauled by a tiger. The rhinoceros having very poor vision, but good hearing, is apt to be nervous of any strange sound and will generally clear off on hearing the human voice. He is not afraid of elephants but does not like them to approach nearer than about 25 yards. He is probably faster than an elephant over short distances and moves noticeably faster than an elephant in shallow water.

The rhinoceros' chief enemy is man and, in this, he is more unfortunate than any other animal for reasons which are based on absurd superstitions. The horn of the male, which is composed of compressed hair, is valued greatly both as an aphrodisiac and as an antidote for various poisons, including opium. Its market value is about 25 rupees per ounce, and a good horn weighs over 60 ounces.

Rhinoceros blood can be sold at two rupees a bottle and urine at the same price. The dried skin and meat are worth about one rupee per pound.

It is easy, therefore, to understand the tremendous value of a dead rhinoceros to anyone who is clever enough to kill one and mar-

ket the entire carcass. Little wonder that the Game Warden must be about his job day and night to prevent poaching.

The rhinoceros is held in great sanctity by all Hindus living in northern India but, fortunately, such religious awe is insufficient to afford protection.

HITCHENIA CAULINA (CHAVAR) AS A SOURCE OF ARROW-ROOT

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The scitaminaceous plant *Hitchenia caulina* occurs gregariously on the tableland of Mahabaleshwar and extends down to the coast on the west. On the Mahabaleshwar plateau alone its distribution is estimated at over 16,000 acres. Enumeration in a dense area gave as many as 20,500 to the acre.

In the past only the Chinese ticket-of-leave men of the Boxer rebellion appear to have utilised the tubers of this plant for the manufacture of arrow-root. The local villagers do not appear to have taken to it as an article of diet. In normal times the cost of manufacture of commercial starch was prohibitive.

As foreign starch was not available in the market due to war conditions, the Sub-Divisional Forest Officer, Satara, sought advice from the Director of Industries, Bombay, who, after testing a parcel of 25 lbs. of the tubers, reported that it was "possible to get arrow-root starch from the Mahabaleshwar tubers. The yield obtained was 7.6 per cent. of the weight of the tubers. The whiteness of the latter portion (about 40-45 per cent.

of the total starch) is not up to the foreign sample and the results obtained so far are very encouraging." It must be noted that the tubers were supplied in September, a time of the year when the starch content is obviously on the low side. As the Director expressed his desire to make further tests, a further parcel of 100 lbs. of tubers was sent to him in April, 1942. A brief summary of the report is given below:

100 lbs. of tubers lost through drying 20 lbs. in transit. The tubers were classified into three size-classes:

Size	Weight in lb.	Moisture percentage.	Starch (lb.)	Starch percentage.
Big	26	67.41	4.78	18.3
Medium	48	67.41	5.4	11.25
Small	5.5	70.49	0.6	10.9

The average was 13.58 per cent. out of which 8 per cent. was superior, absolute white and compared well with starch of foreign make.

Comparative results of arrow-root starch prepared in the laboratory of the Director of Industries and two English samples of well-known brand:

	Laboratory sample	English "A"	English "B"
1. Moisture percentage	10.40	12.90	11.00
2. Ash percentage	0.50	0.28	0.42
3. Water-soluble matter percentage	0.14	0.41	0.19
4. Ether-soluble matter percentage	0.10	0.70	0.64
5. Viscosity at 25° C. in seconds, that of water being 16 seconds	18 Secs.	21 Secs.	17 Secs.
6. Acidity expressed as C.C. of N alkali required to neutralise acid in 100 gms. of starch	1.342 c.c.	0.732 c.c.	1.830 c.c.
7. Starch contents by difference percentage	88.86	85.71	86.83