

it is the only system which offers possibilities of concentrated regeneration, and wherein results are open to evaluation and assessment. Under the Selection System which was practised hitherto the area was far too unwieldy to be effectively tackled by the forester, and more often than not, it was wholly ignored. If any comparison of the system is necessary, one has only to look to the Udil forests opposite Chhatru where heavy selection fellings, under the old plan, have resulted in utter degeneration of the deodar forests into sinister blanks full of broad-leaved shrubs, with no regeneration, whatsoever. The Uniform System takes a little at a time and keeps it on books until it has run the gauntlet. But one thing is necessary if success is intended to be achieved with the Shelterwood System; either the regeneration period should be sufficiently long to admit of natural regeneration, or the Officer-in-Charge must make the most of seed-years and raise a sufficient reserve in nurseries and ash-beds, from where to work at leisure in lean years, or better combine the above two processes of recuperation. Nature is very helpful but it works at a snail's pace, as it is in no hurry, but the forester cannot afford to wait too long; he must, therefore, have up his sleeve sufficient artificial stock to tide over recurrent depressions in deodar seed-years. This only stresses the importance of the personal equation, and subject to that proviso, the Uniform System is the system of quickly regenerating deodar. It is hardly necessary to state that sowing and burning of refuse is necessary only where natural regeneration is not likely to come up, not indiscriminately all over the forest. Generally speaking, the ridges, spurs and upper parts are best regenerated naturally, the foot of deodar forest where there is heavy admixture of *pohu* and other broad-leaved species being treated artificially.

8. One word more about *pohu*, the scarecrow of Kashmir deodar forests. The problem of successfully tackling *pohu* being within sight, the writer must make it clear that the *pohu* is not a 'weed' in the ignominious sense in which that word is often used. Indeed, it is often observed that the *pohu* goes with the very best deodar, being its indicator and helper, as the *pohu* rapidly enriches the soil by its abundant humus. As already mentioned, the

growth of deodar seedlings in the ash-beds under observation in Udil has been fastest and best where the *pohu* was heaviest. From this it is clear that the *pohu*, like fire, is a good servant but a bad master.

#### THE DURATION OF LIFE OF SOME INDIAN MAMMALS.

The duration of life among mammals is a subject of some interest in agriculture and forestry, but practically no information on it has been hitherto available. Major Stanley S. Flower has now concluded a series of "Contributions to our Knowledge of the Duration of Life in Vertebrate Animals" in the *Proceedings of the Zoological Society of London* with a discussion (1931, pp. 145—234) of the available information on mammals. From this splendid work, which is based on a large series of records of mammals in captivity in various parts of the world, the following information relating to Indian species has been abstracted by request. The names in brackets are those used by Blanford in his volume on mammals in the "Fauna of British India" series.

The Gibbons, *Hylobates hoolock*, *H. lar*, etc., reach maturity when about seven years old. "Instances of their living in captivity to nine years are rare, though they may live to the age of at least twenty-four years."

"The Old-World Monkeys, regardless of size, appear to have an average life of under seven years, a specific longevity of about ten years, a full-span life of about fifteen years, and a potential longevity of about twenty-five to thirty years." Langurs have lived in captivity in Calcutta for ten years, and a Nilgiri Langur survived for fifteen years in the Trivandrum Zoo.

Among the *Macacus* monkeys, the common *M. mulatta* (better known as *M. rhesus*) frequently lives to fifteen years and even more. There is a record of one individual that was probably twenty-nine years old at the time of its death. The Bonnet Monkey, *M. radiata* (*M. sinicus*) averaged a life of twelve years in the Trivandrum Zoo, and one individual lived to fifteen years. The Macaque or Kra Monkey, *M. irus* (*M. cynomolgus*)

Giant Squirrel, *Ratufa indica*. A specimen, in the possession of the Bombay Natural History Society, lived for over sixteen years.

Hodgson's Marmot, *Marmota* (= *Arctomys*) *caudata*. Three individuals lived to over six years in the London Zoo.

Black and Brown Rats, *Rattus rattus* and *R. norvegicus*. The average life of these rats is probably two to three years, but definite information is not available.

House Mouse, *Mus musculus*. Major Flower's longest record is only a year and a half. As a school boy I domesticated a litter of mice; they remained alive for about a year.

Bamboo Rat, *Rhizomys badius*. A specimen lived in Calcutta for at least three years; another lived in the London Zoo for nearly three and a half years.

Porcupines (*Hystrix* spp.) and Brush-tailed Porcupines (*Atherurus* spp.) live from eight to twelve years, extreme longevity in *Hystrix* being represented by a specimen that lived to nearly twenty and a half years in the London Zoo. Hares and rabbits "live to an age of five or six years, and exceptionally to twice as long."

The specific and potential longevity of the Indian Elephant appears to have been greatly exaggerated by several writers including Blanford. According to Flower there is no "absolutely convincing evidence of an Elephant living to the age of 100 years." Of sixty elephants seen by him in India and Burma in 1913 the oldest were under fifty-five years of age, while from records of elephants outside India "that have lived longest in their respective new homes we find that they have an average life of a little over twenty-eight years" and it is reasonable to suppose that elephants survive even better in captivity than they do in the wild state. From the evidence of dentition seventy years would appear to be a liberal estimate of the potential longevity of an Indian Elephant. It is also of interest to add that elephants become sexually mature at an earlier age than is commonly supposed. Cases are known of

elephants that have calved when between thirteen and sixteen years of age.

Asiatic wild Asses average a life (according to twenty-three records) of about fifteen and a half years and may live to twenty-two years or more. Records of Kiangs, *Equus kiang* (*E. hemionus*) show that individuals may live in captivity for periods ranging from eighteen to twenty-five years. A female Indian wild Ass died in the London Zoo after nearly sixteen years of captivity.

Most rhinoceroses are said to live for less than ten years in captivity, but "twenty-seven selected individuals show an average life of almost twenty-two years," and individuals have been known that have lived for over forty years. Fifteen records of the Great Indian Rhinoceros, *Rhinoceros unicornis*, show an average life of about twenty-nine years, a minimum of fifteen and a quarter years and a maximum of forty-seven years. An individual of the smaller Sondaic Rhinoceros, *R. sondaicus*, lived in the London Zoo for nearly eleven years, and another in the Calcutta Zoo for over fourteen years. Four records for the two-horned Rhinoceros, *R. sumatrensis*, show a life between ten and thirty-five years.

The majority of Tapirs live less than six years in captivity, but their potential longevity is at least thirty years. The average for eighteen individuals over seven years of age is about fifteen years. The longest records in the London Zoo for Malay Tapirs, *Tapirus indicus*, are nine and a half years for a male and a little over eleven years for a female. A Tapir, probably the same species, lived in the Trivandrum Zoo for twenty-three years.

The larger wild cattle have a specific longevity of nine to twelve years, and a potential longevity of twenty to twenty-five years, or even (but very rarely) thirty years. The Domestic Humped Ox, *Bos indicus*, frequently lives between ten and fourteen years; a pair of gayals, *Bibos* (= *Bos*) *frontalis*, lived in London for about fifteen years; Yaks, *Poepphagus* (= *Bos*) *grunniens*, are capable of breeding to at least eighteen years of age, six records of long-lived Yaks ranging from fifteen to nearly twenty-four years. A very long-lived Asiatic Buffalo, *Bubalis* (= *Bos*) *bubalis* lived in

Regarding the Indian Wild Boar the Superintendent of the Calcutta Zoological Gardens informs us that they live for fifteen to twenty years, but Flower's records for wild swine show that twenty years is the potential longevity, the average being in the neighbourhood of ten years. An Andaman Boar, *Sus andamanensis*, lived in the London Zoo for a little over twelve years.

It may be of interest to add that among domestic animals the ordinary extreme age for cats is about fifteen years; the average life of a dog in England is less than four years, though the potential life is very much more. A dog is old at ten years, but cases are known, especially among terriers, of survival to twice this age and more. Of horses it is said that given a fair chance it is not unusual for them to live to, and be capable of reproduction at, twenty five years, the average extreme age being in the neighbourhood of thirty-five years. The oldest age claimed for a horse is sixty-two years, and authenticated cases of horses living for forty to fifty-five years are known. Donkeys may live for forty to fifty years, but the average good life is probably about twenty years. Mules appear to have much the same span of life as donkeys. For domestic oxen and cows the specific longevity lies between five and twelve years, for sheep between seven (ewes) and twelve (rams) years. Goats have an ordinary life of eight to ten years, but may live and be useful for much longer. A camel generally passes the point of utility at twenty years, and should not be used for hard work before it is six years old. The extreme age of a camel may be about forty years.

In concluding it may be stated that, contrary to popular belief, man tops the list of long-lived mammals. The biblical span of 'three score years and ten' is a fair average, but individuals may live to a hundred years and even much more. The Asiatic elephant and the horse are the longest lived mammals after man. Insectivorous bats, insectivores, and small rodents are the shortest lived mammals, their maximum expectancy of life being in the neighbourhood of five years. In such cases the equilibrium of population is maintained by great fecundity.

CEDRIC DOVER.

## THE HOLY KAILASH MOUNTAIN.

BY KAILASH CHANDRA, RANGE OFFICER, KAILASH RANGE,  
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Kailash peak is said to be the residence of Lord Shiva and is, therefore, considered to be sacred. There is a common belief that a tour round this peak washes away sins and promotes the fulfilment of one's desires. A tour round Kailash can be completed in 10 days, walking daily without a halt. The journey is so difficult that it is the real place to do away with sins, but the other object regarding the fulfilment of one's desires remains to be verified.

The holy Kailash is well over 22,000 feet above mean sea level; it is conical in shape and looks like a temple and is situated in the inner Himalayas in Bashahr State of Simla District bordering on the Tibetan plateau. It is encircled by 3 beautiful valleys, the Sutlej valley to the north-west, the Tiding valley to the east and the Baspa valley to the south west. All the three valleys are situated in similar country, but they are very different in vegetation and are full of forest interest. It is not that this trip is interesting from a religious point of view, but a forester will be greatly benefited if he walks with zealous eyes for forestry. A shikari will be pleased to find big game in the upper parts of the Tiding and Bashahr valleys. It is recommended to all forest officers who happen to visit Bashahr to complete the tour as it is the place to learn all about the natural phenomenon.

The first march of the trip commences from Kilba, 130 miles from Simla, along the Hindustan Tibet road. Kilba to Shontong is 10 miles (6,000 ft.), Shontong to Purbani 8 miles (8,000 ft.), Purbani to Thangi 10 miles (9,000 ft.) which is the end of the Sutlej valley, and a forester will see beautiful forests of deodar in the dry zone with lovely young regeneration between 7,500 ft. and 15,000 ft. Above the deodar belt there is a small strip of *Betula* and *Rhododendron* species and then the lofty Kailash Range covered by the perpetual snows. In the lower part of the deodar forests there is an admixture of *neosa* (*Pinus gerardiana*) and lower down nothing is to be found but pure *neosa* trees growing