

The Minds and Manners of Wild Animals

William T. Hornaday

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by William T. Hornaday**

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[Illustration with caption: OVERPOWERING CURIOSITY OF A MOUNTAIN SHEEP
This "lava ram" stood thus on a lava crest in the Pinacate Mountains
for about twenty minutes, gazing spellbound at two men and a pack mule.
(See page 149)]

THE MINDS AND MANNERS OF WILD ANIMALS

A BOOK OF PERSONAL OBSERVATIONS

BY WILLIAM T. HORNADAY, Sc.D., A.M. DIRECTOR OF THE NEW YORK
ZOOLOGICAL PARK. AUTHOR OF "THE AMERICAN NATURAL HISTORY," "TWO
YEARS IN THE JUNGLE," "CAMP FIRES IN THE CANADIAN ROCKIES," "OUR
VANISHING WILD LIFE," ETC.

WITH ILLUSTRATIONS

The wild animal must think, or die. * * * * *

"Prove all things; hold fast that which is good."

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Published May, 1922

TO THE OFFICERS AND MEN OF THE NEW YORK ZOOLOGICAL PARK, WHOSE SAFETY
DEPENDS UPON THEIR KNOWLEDGE OF THE MINDS OF WILD ANIMALS, THIS VOLUME
IS DEDICATED AS A TOKEN OF APPRECIATION AND REGARD

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THE CURTAIN.

PREFACE

During these days of ceaseless conflict, anxiety and unrest among men, when at times it begins to look as if "the Caucasian" really is "played out," perhaps the English-reading world will turn with a sigh of relief to the contemplation of wild animals. At all events, the author has found this diversion in his favorite field mentally agreeable and refreshing.

In comparison with some of the alleged men who now are cursing this earth by their baneful presence, the so-called "lower animals" do not seem so very "low" after all! As a friend of the animals, this is a very proper time in which to compare them with men. Furthermore, if thinking men and women desire to know the leading facts concerning the intelligence of wild animals, it will be well to consider them now, before the bravest and the best of the wild creatures of the earth go down and out under the merciless and inexorable steam roller that we call Civilization.

The intelligence and the ways of wild animals are large subjects. Concerning them I do not offer this volume as an all-in-all production. Out of the great mass of interesting things that might

have been included, I have endeavored to select and set forth only enough to make a good series of sample exhibits, without involving the general reader in a hopelessly large collection of details. The most serious question has been: What shall be left out?

Mr. A. R. Spofford, first Librarian of Congress, used to declare that "Books are made from books"; but I call the reader to bear witness that this volume is not a mass of quotations. A quoted authority often can be disputed, and for this reason the author has found considerable satisfaction in relying chiefly upon his own testimony.

Because I always desire to know the opinions of men who are writing upon their own observations, I have felt free to express my own conclusions regarding the many phases of animal intelligence as their manifestation has impressed me in close-up observations.

I have purposely avoided all temptations to discuss the minds and manners of domestic animals, partly because that is by itself a large subject, and partly because their minds have been so greatly influenced by long and close association with man. The domestic mammals and birds deserve independent treatment.

A great many stories of occurrences have been written into this volume, for the purpose of giving the reader all the facts in order that he may form his own opinions of the animal mentality displayed.

Most sincerely do I wish that the boys and girls of America, and of the whole world, may be induced to believe that the most interesting thing about a wild animal is its mind and its reasoning, and that a dead animal is only a poor decaying thing. If the feet of the young men would run more to seeing and studying the wild creatures and less to the killing of them, some of the world's valuable species might escape being swept away tomorrow, or the day after.

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W. T. H.

The Anchorage, Stamford, Conn. December 19, 1921.

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THE MINDS AND MANNERS OF WILD ANIMALS

MAN AND THE WILD ANIMALS

If every man devoted to his affairs, and to the affairs of his city and state, the same measure of intelligence and honest industry that every warm-blooded wild animal devotes to its affairs, the people of this world would abound in good health, prosperity, peace and happiness.

To assume that every wild beast and bird is a sacred creature, peacefully dwelling in an earthly paradise, is a mistake. They have their wisdom and their folly, their joys and their sorrows, their trials and tribulations.

As the alleged lord of creation, it is man's duty to know the wild animals truly as they are, in order to enjoy them to the utmost, to utilize them sensibly and fairly, and to give them a square deal.

I. A SURVEY OF THE FIELD

I

THE LAY OF THE LAND

There is a vast field of fascinating human interest, lying only just outside our doors, which as yet has been but little explored. It is the Field of Animal Intelligence.

Of all the kinds of interest attaching to the study of the world's wild animals, there are none that surpass the study of their minds, their morals, and the acts that they perform as the results of their mental processes.

In these pages, the term "animal" is not used in its most common and most restricted sense. It is intended to apply not only to quadrupeds, but also to all the vertebrate forms,--mammals, birds, reptiles, amphibians and fishes.

For observation and study, the whole vast world of living creatures is ours, throughout all zones and all lands. It is not ours to flout, to abuse, or to exterminate as we please. While for practical reasons we do not here address ourselves to the invertebrates, nor even to the sea-rovers, we can not keep them out of the background of our thoughts. The living world is so vast and so varied, so beautiful and so ugly, so delightful and so terrible, so interesting and so commonplace, that each step we make through it reveals things different and previously unknown.

The Frame of Mind. To the inquirer who enters the field of animal thought with an open mind, and free from the trammels of egotism and fear regarding man's place in nature, this study will prove an endless succession of surprises and delights. In behalf of the utmost tale of results, the inquirer should summon to his aid his rules of evidence, his common sense, his love of fair play, and the inexorable logic of his youthful geometry.

And now let us clear away a few weeds from the entrance to our field, and reveal its cornerstones and boundary lines. To a correct understanding of any subject a correct point of view is absolutely essential.

In a commonplace and desultory way man has been mildly interested in the intelligence of animals for at least 30,000 years. The Cro-Magnons of that far time possessed real artistic talent, and on the smooth stone walls and ceilings of the caves of France they drew many wonderful pictures of mammoths, European bison, wild cattle, rhinoceroses and other animals of their period. Ever since man took unto himself certain tractable wild animals, and made perpetual thralls of the horse, the dog, the cat, the cattle, sheep, goats and swine, he has noted their intelligent ways. Ever since the first caveman began to hunt wild beasts and slay them with clubs and stones, the two warring forces have been interested in each other, but for about 25,000 years I think that the wild beasts knew about as much of man's intelligence as men knew of theirs.

I leave to those who are interested in history the task of revealing the date, or the period, when scholarly men first began to pay serious attention to the animal mind.

In 1895 when Mr. George J. Romanes, of London, published his excellent work on "Animal Intelligence," on one of its first pages he blithely brushed aside as of little account all the observations, articles and papers on his subject that had been published previous to that time. Now mark how swiftly history can repeat itself, and also bring retribution.

In 1910 there arose in the United States of America a group of professional college-and-university animal psychologists who set up the study of "animal behavior." They did this so seriously, and so determinedly, that one of the first acts of two of them consisted in joyously brushing aside as of no account whatever, and quite beneath serious consideration, everything that had been seen, done and said previous to the rise of their group, and the laboratory Problem Box. In view of what this group has accomplished since 1910, with their "problem boxes," their "mazes" and their millions of "trials by error," expressed in solid pages of figures, the world of animal lovers is entitled to smile tolerantly upon the cheerful assumptions of ten years ago.

But let it not at any time be assumed that we are destitute of problem boxes; for the author has two of his own! One is called the Great Outdoors, and the other is named the New York Zoological Park. The first has been in use sixty years, the latter twenty-two years. Both are today in good working order, but the former is not quite as good as new.

A Preachment to the Student. In studying the wild-animal mind, the boundary line between Reality and Dreamland is mighty easy to cross. He who easily yields to seductive reasoning, and the call of the wild imagination, soon will become a dreamer of dreams and a seer of visions of things that never occurred. The temptation to place upon the simple acts of animals the most complex and far-fetched interpretations is a trap ever ready for the feet of the unwary. It is better to see nothing than to see a lot of things that are not true.

In the study of animals, we have long insisted that _to the open eye and the thinking brain, truth is stranger than fiction._ But Truth does not always wear her heart upon her sleeve for zany to peck at. Unfortunately there are millions of men who go through the world looking at animals, but not seeing them.

Beware of setting up for wild animals impossible mental and moral standards. The student must not deceive himself by overestimating mental values. If an estimate must be made, make it under the mark of truth rather than above it. While avoiding the folly of idealism, we also must shun the ways of the narrow mind, and the eyes that refuse to see the truth. Wild animals are not superhuman demigods of wisdom; but neither are they idiots, unable to reason from cause to effect along the simple lines that vitally affect their existence.

Brain-owning wild animals are not mere machines of flesh and blood, set agoing by the accident of birth, and running for life on the narrow-gauge railway of Heredity. They are not "Machines in Fur and Feathers," as one naturalist once tried to make the world believe them to be. Some animals have more intelligence than some men; and some have far better morals.

What Constitutes Evidence. The best evidence regarding the ways of wild animals is one's own eye-witness testimony. Not all second-hand observations are entirely accurate. Many persons do not know how to observe; and at times some are deceived by their own eyes or ears. It is a sad fact that both those organs are easily deceived. The student who is in doubt regarding the composition of

evidence will do well to spend a few days in court listening to the trial of an important and hotly contested case. In collecting real evidence, all is not gold that glitters.

Many a mind misinterprets the thing seen, sometimes innocently, and again wantonly. The nature fakir is always on the alert to see wonderful phenomena in wild life, about which to write; and by preference he places the most strained and marvellous interpretation upon the animal act. Beware of the man who always sees marvellous things in animals, for he is a dangerous guide. There is one man who claims to have seen in his few days in the woods more wonders than all the older American naturalists and sportsmen have seen added together.

Now, Nature does not assemble all her wonderful phenomena and hold them in leash to be turned loose precisely when the great Observer of Wonders spends his day in the woods. Wise men always suspect the man who sees too many marvelous things.

The Relative Value of Witnesses. It is due that a word should be said regarding "expert testimony" in the case of the wild animal. Some dust has been raised in this field by men posing as authorities on wild animal psychology, whose observations of the world's wild animals have been confined to the chipmunks, squirrels, weasels, foxes, rabbits, and birds dwelling within a small circle surrounding some particular woodland house. In another class other men have devoted heavy scientific labors to laboratory observations on white rats, domestic rabbits, cats, dogs, sparrows, turtles and newts as the handpicked exponents of the intelligence of the animals of the world!

Alas! for the human sense of Proportion!

Fancy an ethnologist studying the Eskimo, the Dog-Rib Indian, the Bushman, the Aino and the Papuan, and then proceeding to write conclusively "On the Intelligence of the Human Race."

The proper place in which to study the minds, manners and morals of wild animals is in the most thickly populated haunts of the most intelligent species. The free and untrammelled animal, busily working out its own destiny unhindered by man, is the beau-ideal animal to observe and to study. Go to the plain, the wilderness, the desert and the mountain, not merely to shoot everything on foot, but to SEE _animals at home,_ and there use your eyes and your field-glass. See what _normal wild animals_ do as "behavior," and then try to find out why they do it.

The next best place for study purposes is a spacious, sanitary and well-stocked zoological park, wherein are assembled great collections of the most interesting land vertebrates that can be procured, from all over the earth. There the student can observe many new traits of wild animal character, as they are brought to the surface by captivity. There will some individuals reveal the worst traits of their species. Others will reveal marvels in

mentality, and teach lessons such as no man can learn from them in the open. To study temperament, there is no place like a zoo.

Even there, however, the wisest course,--as it seems to me,--is

not to introduce too many appliances as aids to mental activity, but rather to see what the animal subject thinks and does _by its own initiative._ In the testing of memory and the perceptive faculties, training for performances is the best method to pursue.

The reader has a right to know that the author of this volume has enjoyed unparalleled opportunities for the observation and study of highly intelligent wild animals, both in their wild haunts and in a great vivarium; and these combined opportunities have covered a long series of years.

Before proceeding farther, it is desirable to define certain terms that frequently will be used in these pages.

THE ANIMAL BRAIN is the generator of the mind, and the clearing-house of the senses. As a mechanism, the brain of man is the most perfect, and in the descent through the mammals, birds, reptiles, amphibians and fishes, the brain progressively is simplified in form and function.

THOUGHT is the result of the various processes of the brain and nervous system, stimulated by the contributions of the senses.

SANITY is the state of normal, orderly and balanced thought, as formulated by a healthy brain.

INSANITY is a state of mental disease, resulting in disordered, unbalanced and chaotic thought, destitute of reason.

REASON is the manifestation of correct observation and healthful thought which recognizes both cause and effect, and leads from premise to conclusion. **INTELLIGENCE** is created by the possession of knowledge either inherited or acquired. It may be either latent or active; and it is the forerunner of reason.

INSTINCT is the knowledge or impulse which animals or men derive from their ancestors by inheritance, and which they obey, either consciously or subconsciously in working out their own preservation, increase and betterment. Instinct often functions as a sixth sense.

EDUCATION is the acquirement of knowledge by precept or by observation; but animals as well as men may be self-taught, and become self-educated, by the diligent exercise of the observing and reasoning faculties. The adjustment of a wild animal mind to conditions unknown to its ancestors is through the process of self-education, and by logical reasoning from premise to conclusion.

The wild animal must think, or die.

Animal intelligence varies in quantity and quality as much as animals vary in size. Idiots, maniacs and sleeping persons are the only classes of human beings who are devoid of intelligence and reasoning power. Idiots and maniacs also are often devoid of the common animal _instinct_ that ordinarily promotes self-preservation from fire, water and high places. A heavily sleeping person is often so sodden in slumber that his senses of smell and

hearing are temporarily dead; and many a sleeping man has been asphyxiated by gas or smoke, or burned to death, because his deadened senses failed to arouse him at the critical moment. (This dangerous condition of mind can be cured by efforts of the will, exercised prior to sleep, through a determination resolutely to arouse and investigate every unusual sensation that registers "danger" on any one of the senses.) The normal individual sleeps with a subconscious and sensitive mind, from which thought and reason have not been entirely eliminated.

Every act of a man or animal, vertebrate or invertebrate, is based upon either reason or hereditary instinct. It is a mistake to assume that because an organism is small it necessarily has no "mind," and none of the propelling impulse that we call thought. The largest whale may have less intelligence and constructive reasoning than a trap-door spider, a bee or an ant. To deny this is to deny the evidence of one's senses.

A MEASURE FOR ANIMAL INTELLIGENCE. The intelligence of an animal may be estimated by taking into account, separately, its mental qualities, about as follows:

1. General knowledge of surrounding conditions.
2. Powers of independent observation and reasoning.
3. Memory.
4. Comprehension under tuition.
5. Accuracy in the execution of man's orders.

Closely allied to these are the moral qualities which go to make up an animal's temperament and disposition, about as follows:

1. Amiability, which guarantees security to its associates.
2. Patience, or submission to discipline and training.
3. Courage, which gives self-confidence and steadiness.
4. A disposition to obedience, with cheerfulness.

All normal vertebrate animals exercise their intelligence in accordance with their own rules of logic. Had they not been able to do so, it is reasonable to suppose that they could never have developed into vertebrates, reaching even up to man himself.

According to the laws of logic, this proposition is no more open to doubt or dispute than is the existence of the Grand Canyon of the Colorado. But few persons have seen the Canyon, and far fewer ever have proven its existence by descending to its bottom; but none the less Reason admonishes all of us that the great chasm exists, and is not a debatable question.

To men and women who really know the vertebrate animals by contact with some of them upon their own levels, the reasoning power of the latter is not a debatable question. The only real question is: how far does their intelligence carry them? It is with puzzled surprise that we have noted the curious diligence of the professors of animal psychology in always writing of "animal behavior," and never of old-fashioned, common-sense animal intelligence. Can it be possible that any one of them really refuses to concede to the wild animal the possession of a mind, and a working intelligence?

Yes. Animals do reason. If any one truth has come out of all the critical or uncritical study of the animal mind that has been going on for two centuries, it is this. Animals do reason; they always have reasoned, and as long as animals live they never will cease to reason.

The higher wild animals possess and display the same fundamental passions and emotions that animate the human race. This fact is subject to intelligent analysis, discussion and development, but it is not by any means a "question" subject to debate. In the most intellectual of the quadrupeds, birds and reptiles, the display of fear, courage, love, hate, pleasure, displeasure, confidence, suspicion, jealousy, pity, greed and generosity are so plainly evident that even children can and do recognize them. To the serious and open-minded student who devotes prolonged thought to these things, they bring the wild animal very near to the "lord of creation."

To the question, "Have wild animals souls?" we reply, "That is a debatable question. Read; then think it over."

METHODS WITH THE ANIMAL MIND. In the study of animal minds, much depends upon the method employed. It seems to me that the problem-box method of the investigators of "animal behavior" leaves much to be desired. Certainly it is not calculated to develop the mental status of animals along lines of natural mental progression. To place a wild creature in a great artificial contrivance, fitted with doors, cords, levers, passages and what not, is enough to daze or frighten any timid animal out of its normal state of mind and nerves. To put a wild sapajou monkey,--weak, timid and afraid,--in a strange and formidable prison box filled with strange machinery, and call upon it to learn or to invent strange mechanical processes, is like bringing a boy of ten years up to a four-cylinder duplex Hoe printing-and-folding press, and saying to him: "Now, go ahead and find out how to run this machine, and print both sides of a signature upon it."

The average boy would shrink from the mechanical monster, and have no stomach whatever for "trial by error."

I think that the principle of determining the mind of a wild animal along the lines of the professor is not the best way. It should be developed along the natural lines of the wild-animal mind. It should be stimulated to do what it feels most inclined to do, and educated to achieve real mental progress.

I think that the ideal way to study the minds of apes, baboons and monkeys would be to choose a good location in a tropical or sub-tropical climate that is neither too wet nor too dry, enclose an area of five acres with an unclimbable fence, and divide it into as many corrals as there are species to be experimented upon. Each corral would need a shelter house and indoor playroom. The stage properties should be varied and abundant, and designed to stimulate curiosity as well as activity.

Somewhere in the program I would try to teach orang-utans and chimpanzees the properties of fire, and how to make and tend fires. I would try to teach them the seed-planting idea, and the meaning of seedtime and harvest. I would teach sanitation and

cleanliness of habit,--a thing much more easily done than most persons suppose. I would teach my apes to wash dishes and to cook, and I am sure that some of them would do no worse than some human members of the profession who now receive \$50 per month, or more, for spoiling food.

In one corral I would mix up a chimpanzee, an orang-utan, a golden baboon and a good-tempered rhesus monkey. My apes would begin at two years old, because after seven or eight years of age all apes are difficult, or even impossible, as subjects for peaceful experimentation.

I would try to teach a chimpanzee the difference between a noise and music, between heat and cold, between good food and bad food. Any trainer can teach an animal the difference between the blessings of peace and the horrors of war, or in other words, obedience and good temper versus cussedness and punishment.

Dr. Yerkes' laboratory in Montecito, California, and his experiments there with an orang-utan and other primates, were in a good place, and made a good beginning. It is very much to be hoped that means will be provided by which his work can be prosecuted indefinitely, and under the most perfect conditions that money can provide.

I hope that I will live long enough to see Dr. Yerkes develop the mind of a young grizzly bear in a four-acre lot, to the utmost limits of that keen and sagacious personality.

II

WILD ANIMAL TEMPERAMENT AND INDIVIDUALITY

In man and in vertebrate animals generally, temperament is the foundation of intelligence and progress. Fifty years ago Fowler and Wells, the founders of the science of phrenology and physiognomy, very wisely differentiated and defined four "temperaments" of mankind. The six types now recognized by me are the _morose, lymphatic, sanguine, nervous, hysterical_ and _combative_; and their names adequately describe them.

This classification applies to the higher wild animals, quite as truly as to men. By the manager of wild animals in captivity, wild-animal temperament universally is recognized and treated as a factor of great practical importance. Mistakes in judging the temper of dangerous animals easily lead to tragedies and sudden death.

Fundamentally the temperament of a man or an animal is an inheritance from ancestors near or remote. In the human species a morose or hysterical temperament may possibly be corrected or improved, by education and effort. With animals this is rarely possible. The morose gorilla gives way to cheerfulness only when it is placed in ideally pleasant and stimulating social conditions. This, however, very seldom is possible. The nervous

deer, bear or monkey is usually nervous to the end of its days.

The morose and hysterical temperaments operate against mental development, progress and happiness. In the human species among individuals of equal mental calibre, the sanguine individual is due to rise higher and go farther than his nervous or lymphatic rivals. A characteristic temperament may embrace the majority of a whole species, or be limited to a few individuals. Many species are permanently characterized by the temperament common to the majority of their individual members. Thus, among the great apes the gorilla species is either morose or lymphatic; and it is manifested by persistent inactivity and sullenness. This leads to loss of appetite, indigestion, inactivity and early death. Major Penny's "John Gorilla" was a notable exception, as will appear in Chapter IX.

The orang-utan is sanguine, optimistic and cheerful, a good boarder, affectionate toward his keepers, and friendly toward strangers. He eats well, enjoys life, lives long, and is well liked by everybody.

Except when quite young, the chimpanzee is either nervous or hysterical. After six years of age it is irritable and difficult to manage. After seven years of age (puberty) it is rough, domineering and dangerous. The male is given to shouting, yelling, shrieking and roaring, and when quite angry rages like a demon. I know of no wild animal that is more dangerous per pound than a male chimpanzee over eight years of age. When young they do wonders in trained performances, but when they reach maturity, grow big of arm and shoulder, and masterfully strong, they quickly become conscious of their strength. It is then that performing chimpanzees become unruly, fly into sudden fits of temper, their back hair bristles up, they stamp violently, and sometimes leap into a terrorized orchestra. Next in order, they are retired willy-nilly from the stage, and are offered for sale to zoological parks and gardens having facilities for confinement and control.

The baboons are characteristically fierce and aggressive, and in a wild state they live in troops, or even in herds of hundreds. Being armed with powerful canine teeth and wolf-like jaws, they are formidable antagonists, and other animals do not dare to attack them. It is because of their natural weapons, their readiness to fight like fiends, and their combined agility and strength that the baboons have been able to live on the ground and survive and flourish in lands literally reeking with lions, leopards, hyenas and wild dogs. The awful canine teeth of an old male baboon are quite as dangerous as those of any leopard, and even the leopard's onslaught is less to be feared than the wild rage of an adult baboon. In the Transvaal and Rhodesia, it is a common occurrence for an ambitious dog to go after a troop of baboons and never return.

Temperamentally the commoner groups of monkeys are thus characterized:

The rhesus monkeys of India are nervous, irritable and dangerous.

The green monkeys of Africa are sanguine, but savage and treacherous.

The langur monkeys of India are sanguine and peace-loving.

The macaques of the Far East vary from the sanguine temperament to the combative.

The gibbons vary from sanguine to combative.

The lemurs of Madagascar are sanguine, affectionate and peaceful.

Nearly all South American monkeys are sanguine, and peace-loving, and many are affectionate.

The species of the group of Carnivora are too numerous and too diversified to be treated with any approach to completeness. However, to illustrate this subject the leading species will be noticed.

TEMPERAMENTS OF THE LARGE CARNIVORES

The lion is sanguine, courageous, confident, reposeful and very reliable.

The tiger is nervous, suspicious, treacherous and uncertain.

The black and common leopards are nervous and combative, irreconcilable and dangerous.

The snow leopard is sanguine, optimistic and peace-loving. The puma is sanguine, good natured, quiet and peaceful.

The wolves are sanguine, crafty, dangerous and cruel.

The foxes are hysterical, timid and full of senseless fear.

The lynxes are sanguine, philosophic, and peaceful.

The mustelines are either nervous or hysterical, courageous, savage, and even murderous.

The bears are so very interesting that it is well worth while to consider the leading species separately. Possibly our conclusions will reveal some unsuspected conditions.

BEAR TEMPERAMENTS, BY SPECIES. The polar bears are sanguine, but in captivity they are courageous, treacherous and dangerous.

The Alaskan brown bears in captivity are sanguine, courageous, peaceful and reliable, but in the wilds they are aggressive and dangerous.

The grizzlies are nervous, keen, cautious, and seldom wantonly aggressive.

The European brown bears are sanguine, optimistic and good-natured.

The American black bears are sanguine and quiet, but very treacherous.

The sloth bears of India are nervous or hysterical, and uncertain.

The Malay sun bears are hysterical, aggressive and evil-tempered.

The Japanese black bears are nervous, cowardly and aggressive.

To those who form and maintain large collections of bears, involving much companionship in dens, it is necessary to keep a watchful eye on the temperament chart.

THE DEER. In our Zoological Park establishment there is no collection in which both the collective and the individual equation is more troublesome than the deer family. In their management, as with apes, monkeys and bears, it is necessary to take into account the temperament not only of the species, but also of each animal; and there are times when this necessity bears hard upon human nerves. The proneness of captive deer to maim and to kill themselves and each other calls for the utmost vigilance, and for heroic endurance on the part of the deer keeper.

Even when a deer species has a fairly good record for common sense, an individual may "go crazy" the instant a slightly new situation arises. We have seen barasingha deer penned up between shock-absorbing bales of hay seriously try to jump straight up through a roof skylight nine feet from the floor. We have seen park-bred axis deer break their own necks against wire fences, with 100 per cent of stupidity.

CHARACTERS OF DEER SPECIES

The white-tailed deer is sanguine, but in the fall the bucks are very aggressive and dangerous, and to be carefully avoided. The mule deer is sanguine, reasonable and not particularly dangerous.

The elk is steady of nerve, and sanguine in temperament, but in the rutting season the herd-masters are dangerous.

The fallow deer species has been toned down by a hundred generations of park life, and it is very quiet, save when it is to be captured and crated.

The axis deer is nervous, flighty, and difficult to handle.

The barasingha deer is hysterical and unaccountable.

The Indian and Malay sambar deer are lymphatic, confident, tractable and easily handled.

Never keep a deer as a "pet" any longer than is necessary to place it in a good home. All "pet deer" are dangerous, and should be confined all the time. Never go into the range or corral of a deer herd unless accompanied by the deer-keeper; and in the rutting season do not go in at all.

The only thoroughly safe deer is a dead one; for even does can do mischief. **A SAMPLE OF NERVOUS TEMPERAMENT.** As an example of temperament in small carnivores, we will cite the coati mundi of South America. It is one of the most nervous and restless animals

we know. An individual of sanguine temperament rarely is seen. Out of about forty specimens with which we have been well acquainted, I do not recall one that was as quiet and phlegmatic as the raccoon, the nearest relative of *Nasua*. With a disposition so restless and enterprising, and with such vigor of body and mind, I count it strange that the genus *Nasua* has not spread all over our south-eastern states, where it is surely fitted to exist in a state of nature even more successfully than the raccoon or opossum.

The temper of the coati mundi is essentially quarrelsome and aggressive. While young, they are reasonably peaceful, but when they reach adult age, they become aggressive, and quarrels are frequent. Separations then are very necessary, and it is rare indeed that more than two adult individuals can be caged together. Even when two only are kept together, quarrels and shrill squealings are frequent. But they seldom hurt each other. The coati is not a treacherous animal, it is not given to lying in wait to make a covert attack from ambush, and being almost constantly on the move, it is a good show animal.

THE STRANGE COMBATIVE TEMPERAMENT OF THE GUANACO. In appearance the guanaco is the personification of gentleness. Its placid countenance indicates no guile, nor means of offense. Its lustrous gazelle-like eyes, and its soft, woolly fleece suggest softness of disposition. But in reality no animal is more deceptive. In a wild state amongst its own kind, or in captivity,--no matter how considerably treated,--it is a quarrelsome and at times intractable animal. "A pair of wild guanacos can often be seen or heard engaged in desperate combat, biting and tearing, and rolling over one another on the ground, uttering their gurgling, bubbling cries of rage. Of a pair so engaged, I shot one whose tail had then been bitten off in the encounter. In confinement, the guanaco charges one with his chest, or rears up on his hind legs to strike one with his fore-feet, besides biting and spitting up the contents of the stomach."--Richard Crawshaw in "The Birds of Terra del Fuego."

MENTAL TRAITS AND TEMPER OF THE ATLANTIC WALRUS

Mr. Langdon Gibson, of Schenectady, kindly wrote out for me the following highly interesting observations on a remarkable arctic animal with which we are but slightly acquainted:

"In the summer of 1891, as a member of the first Peary Expedition I had an opportunity of observing some of the traits of the Atlantic walrus. I found him to be a real animal, of huge size, with an extremely disagreeable temper and most belligerently inclined. We hunted them in open whale-boats under the shadows of Greenland's mountain-bound coast, in the Whale Sound region, Lat. 77 degrees North.

"We hunted among animals never before molested, except by the Eskimo who (so far as I was able to ascertain) hunt them only during the winter season on the sea ice. We found animals whose courage and belief in themselves and their prowess had hitherto been unshaken by contact with the white man and his ingenious devices of slaughter.

"The walrus has a steady nerve and a thoroughly convincing roar. They have fought their kind and the elements for centuries and centuries, and know no fear. This, then, was the animal we sought in order to secure food for our dog teams. I can conceive of no form of big game hunting so conducive to great mental excitement and physical activity as walrus hunting from an open whale-boat. At the completion of such a hunt I have seen Eskimo so excited and worked up that they were taken violently sick with vomiting and headache.

"The walrus is a gregarious animal, confederating in herds numbering from ten to fifty, and in some instances no doubt larger numbers may be found together. On calm days they rest in unmolested peace on pans of broken ice which drift up and down the waters of Whale Sound. It is unfortunate that no soundings were taken in the region where the walrus were found, as a knowledge of the depth of water would have furnished some information as to the distances to which the animal will dive in search of food.

"The stomachs of all half- and full-grown walrus taken in Whale Sound were without exception well filled with freshly opened clams, with very few fragments of shells in evidence; the removal of the clam from the shell being as neatly accomplished as though done by an expert oysterman.

"In most cases these segregated herds of walrus were in charge of a large bull who generally occupied a central position in the mass of animals. Upon approaching such a herd for the first time, and when within about 200 feet, a large bull would lift his head, sniff audibly in our direction and give a loud grunt which apparently struck a responsive chord in the other sleeping animals. They would grunt in unison, in more subdued tones, after which the old walrus would drop his head to resume his interrupted nap. Their contempt for us was somewhat disconcerting.

"At the first crack of a rifle, however, the animals immediately aroused, and then during the fusillade which followed there occurred what might be called an orderly scramble for the water. In the first place the young ones were hustled to the edge of the ice-pan, and there, apparently under the protection of the mother's flipper, pushed into the water, immediately followed by the mother. The young bulls followed, and I recall no exceptions where the last animal into the water was not the big bull, who before diving would give our boat a wicked look and a roar of rage.

"The animals would immediately dive, and then we first became aware of a remarkable phenomenon. We found that when excited they would continue their roaring under water, and these strange sounds coming to us from below added considerably to the excitement of the chase. Although the cows and young animals would generally swim to places of safety, the other full grown animals would hover beneath our boat and from time to time come to the surface and charge. These charges were in all cases repulsed by the discharge of our rifles in the faces of the animals. The balls, however, from our .45 calibre carbines would flatten out under the skin on the massive bony structure of the animal's skull, and cause only a sort of rage and a sneeze, but it however had the effect of making them dive again. It is my belief that when enraged the walrus if

not resisted would attack and attempt to destroy a boat. Icqah, one of our native hunters, showed me in the deck of his kyak two mended punctures which he told me were made by the tusks of a walrus that had made an _unprovoked_ attack upon him.

"On more than one occasion I have seen two strong uninjured animals come to the assistance of a wounded companion, and swim away with it to a position of safety, _the injured animal being supported on both sides_, giving the appearance of three animals swimming abreast. The first time I witnessed this I did not comprehend its real meaning, but on another occasion in McCormick Bay I saw a wounded animal leaving a trail of blood and oil, supported on either side by two uninjured ones. They were making a hasty retreat and would occasionally dive together, but would quickly return to the surface.

"We found the most effective exposed spot to place a bullet was at the base of the animal's skull. A walrus instantly killed this way generally sinks, leaving a trail of blood and oil to mark the place of his descent. When hunting these animals it is well to have an Eskimo along with harpoon and line in readiness to make fast; otherwise one is apt to lose his quarry.

"In the early winter we usually found the walrus in smaller groups up in the bays. This was after the ice had begun to make, and in coming to the surface to breathe the animals found it necessary to butt their noses against the ice to break it. I have seen this done in ice at least four inches in thickness. In some instances I have seen a fractured star in the ice, a record of an unsuccessful attempt to make a breathing hole." Around these breathing holes we frequently found fragments of clam-shells, sections of crinoids and sea-anemones. It is evident that after raking the bottom with his tusks and filling his mouth with food, the walrus separates the food he desires to retain and rejects on his way up and at the surface such articles as he has picked up in haste and does not want.

"From the fact that the walrus is easily approached it is a simple matter to kill him with the modern high power rule. It is therefore to be hoped that future expeditions into the arctic seas will kill sparingly of these tremendous brutes which from point of size stand in the foremost rank among mammals."

The Elephant, Rhinoceros and Hippopotamus. _Individual Elephants_ vary in temperament far more than do rhinoceroses or hippopotami, and the variations are wide. In a wild state, elephants are quiet and undemonstrative, almost to the point of dullness. They do not domineer, or hector, or quarrel, save when a rogue develops in the ranks, and sets out to make things interesting by the commission of lawless acts. A professional rogue is about everything that an orthodox elephant should not be, and he soon makes of himself so great a nuisance that he is driven out of the herd.

The temperament of the standardized and normal elephant is distinctly sanguine, _but a nervous or hysterical individual is easily developed by bad conditions or abuse_. Adult male elephants are subject to various degrees of what we may as well call sexual insanity, which is dangerous in direct proportion to

its intensity. This causes many a "bad" show elephant to be presented to a zoological garden, where the dangers of this mental condition can at least be reduced to their lowest terms. Our Indian elephant who was known as Gunda was afflicted with sexual insanity, and he gradually grew worse, and increasingly dangerous to his keepers, until finally it was necessary to end his troubles painlessly with a bullet through his brain.

The Rhinoceros is a sanguine animal, of rather dull vision and slow understanding. In captivity it gives little trouble, and lives long. Adults individually often become pettish, or peevish, and threaten to prod their keepers without cause, but I have never known a keeper to take those lapses seriously. The average rhino is by no means a dull or a stupid animal, and they have quite enough life to make themselves interesting to visitors. In British East Africa a black rhinoceros often trots briskly toward a caravan, and seems to be charging, when in reality it is only desiring a "close-up" to satisfy its legitimate curiosity.

Every Hippopotamus, either Nile or pygmy, is an animal of serene mind and steady habits. Their appetites work with clock-like regularity, and require no winding. I can not recall that any one of our five hippos was ever sick for a day, or missed a meal. When the idiosyncrasies of Gunda, our bad elephant, were at their worst, the contemplation of Peter the Great ponderously and serenely chewing his hay was a rest to tired nerves. Keeper Thuman treats the four pygmy hippos like so many pet pigs,--save the solitary adult male, who sets himself up to be peevish. The breeding female is a wise and good mother, with much more maternal instinct than our chimpanzee "Suzette."

It may be set down as an absolute rule that hippos are lymphatic, easy-going, contented, and easy to take care of provided they are kept scrupulously clean, and are fed as they should be fed. They live long, breed persistently, give no trouble and have high exhibition value.

Giraffe individuals vary exceedingly,--beyond all other hoofed animals. Each one has its own headful of notions, and rarely will two be found quite alike in temperament and views of life. Some are sanguine and sensible, others are nervous, crotchety, and full of senseless fears. Those who are responsible for them in captivity are constantly harassed by fears that they will stampede in their stalls or yards, and break their own necks and legs in most unexpected ways. They require greater vigilance than any other hoofed animals we know. Sometimes a giraffe will develop foolishness to such a degree as to be unwilling to go out of its own huge door, into a shady and comfortable yard.

III

THE LANGUAGE OF WILD ANIMALS

Language is the means by which men and animals express their thoughts. Of language there are four kinds: vocal, pictured,

written and sign language.

Any vocal sound uttered for the purpose of conveying thought, or influencing thought or action, is to be classed as vocal language. Among the mammals below man, _speech_ is totally absent; but parrots, macaws, cockatoos and crows have been taught to imitate the sound of man's words, or certain simple kinds of music.

The primitive races of mankind first employed the sign language, and spoken words. After that comes picture language, and lastly the language of written words. Among the Indians and frontiersmen of the western United States and Canada, the sign language has reached what in all probability is its highest development, and its vocabulary is really wonderful.

The higher wild animals express their thoughts and feelings usually by sign language, and rarely by vocal sounds. Their power of expression varies species by species, or tribe by tribe, quite as it does among the races and tribes of men. It is our belief that there are today several living races of men whose vocabularies are limited to about 300 words.

Very many species of animals appear to be voiceless; but it is hazardous to attempt to specify the species. Sometimes under stress of new emergencies, or great pain, animals that have been considered voiceless suddenly give tongue. That hundreds of species of mammals and birds use their voices in promoting movements for their safety, there is no room to doubt. The only question is of the methods and the extent of voice used. Birds and men give expression to their pleasure or joy by singing.

In the jungle and the heavily wooded wilderness, one hears really little of vocal wild-animal language. Through countless generations the noisiest animals have been the first ones to be sought out and killed by their enemies, and only the more silent species have survived. All the higher animals, as we call the higher vertebrates, have the ability to exchange thoughts and convey ideas; and that is language.

At the threshold of this subject we are met by two interesting facts. Excepting the song-birds, the wild creatures of today have learned through instinct and accumulated experience that silence promotes peace and long life. The bull moose who bawls through a mile of forest, and the bull elk who bugles not wisely but too well, soon find their heads hanging in some sportsman's dining-room, while the silent Virginia deer, like the brook, goes on forever.

Association with man through countless generations has taught domestic animals not only the fact of their safety when giving voice, but also that very often there is great virtue in a vigorous outcry. With an insistent staccato neigh, the hungry horse jars the dull brain of its laggard master, and prompts him to "feed and water the stock." But how different is the cry of a lost horse, which calls for rescue. It cannot be imitated in printed words; but every plainsman knows the shrill and prolonged trumpet-call of distress that can be heard a mile or more, understandingly.

And think of the vocabulary of the domestic chicken! Years of life in fancied security have developed a highly useful vocabulary of language calls and cries. The most important, and the best known, are the following:

"Beware the hawk!"--"Coor! Coor!" "Murder! Help!"--"Kee-
owk! Kee-_owk_! Kee-_owk_!" "Come on"--"Cluck!
Cluck! Cluck!" "Food here! Food!"--"Cook-cook-cook-cook!"
Announcement, or alarm--"Cut-cut-cut-_dah_-cut!" But does
the wild jungle-fowl, the ancestor of our domestic chicken,
indulge in all those noisy expressions of thought and feeling? By
no means. I have lived for months in jungles where my hut was
surrounded by jungle-fowl, and shot many of them for my table; but
the only vocal sound I ever heard from their small throats was the
absurdly shrill bantam-like crow of the cock. And even that led to
several fatalities in the ranks of _Gallus stanleyi_.

Domestic cattle, swine and fowls have each a language of their
own, and as far as they go they are almost as clear-cut and
understandable as the talk of human beings. Just how much more is
behind the veil that limits our understanding we cannot say; but
no doubt there is a great deal.

But it is with the language of wild animals that we are most
concerned. As already pointed out, wild creatures, other than
song-birds, do not care to say much, because of the danger of
attracting enemies that will exterminate them. Herein lies the
extreme difficulty of ascertaining how wild beasts communicate.
In the Animallai Hills of southern India I hunted constantly for
many weeks through forests actually teeming with big game. There
were herds upon herds of elephants, gaur, axis deer, sambar deer,
monkeys by the hundred, and a good sprinkling of bears, wild hogs
and tigers.

We saw hundreds upon hundreds of animals; but with the exception
of the big black monkeys that used to swear at us, I can almost
count upon my fingers the whole number of times that we heard
animals raise their voices to communicate with each other.

Ape Voices. Naturally it is of interest to know something of the
voices of the animals that physically and mentally stand nearest
to man.

The wild gorilla has a voice almost equal to that of the
chimpanzee, but in captivity he rarely utters any vocal sound
other than a shriek, or scream.

The baby orang-utan either whines or shrieks like a human child.
The half-grown or adult orang when profoundly excited bellows or
roars, in a deep bass voice. Usually, however, it is a
persistently silent animal.

The chimpanzee has a voice, and vociferously expresses its
emotions.

First and most often is the plaintive, coaxing note, "Who'-oo!
who'-oo! who'-oo!"

Then comes the angry and threatening, "Wah', wah', wah-!"

_Wah' _-hool _Wah' _-hool"

Lastly we hear the fearful, high-pitched yell or shriek, "Ah-h-h-h!" or "E-e-e-e."

The shriek, or scream, can be heard half a mile, and at close range it is literally ear-splitting. Usually it is accompanied by violent stamping or pounding with the feet upon the floor. It may signify rage, or nothing more than the joy of living, and of having a place in which to yell. It is this cry that is uncannily human-like in sound, and when heard for the first time it seems to register anguish.

In its Bornean jungle home, the orang-utan is nearly as silent as the grave. Never save once did I hear one utter a vocal sound. That was a deep bass roar emitted by an old male that I disturbed while he was sleeping on the comfortable nest of green branches that he had built for himself.

Concerning the chimpanzee, the late Mr. Richard L. Garner testified as follows:

"Not only does the chimpanzee often break the silence of the forest when all other voices are hushed, but he frequently answers the sounds of other animals, as if in mockery or defiance. ... Although diurnal in habit, the chimpanzees often make the night reverberate with the sounds of their terrific screaming, which I have known them to continue at times for more than an hour, with scarcely a moment's pause,--not one voice but many, and within the area of a square mile or so I have distinguished as many as seven alternating adult male voices.

"The gorilla is more silent and stoical than the chimpanzee, but he is far from being mute. He appears to be devoid of all risibility, but he is often very noisy. Although diurnal in habit, he talks less frequently during the day than at night, but his silence is a natural consequence of his stealth and cunning. There are times, however, when he ignores all danger of betraying his whereabouts or his movements, and gives vent to a deluge of speech. At night his screams and shouts are terrific."

The gibbons (including the siamang) have tremendous voices, with numerous variations, and they love to use them. My acquaintance with them began in Borneo, in the dense and dark coastal forest that there forms their home. I remember their cries as vividly as if I had heard them again this morning. While feeding, or quietly enjoying the morning sun, the gray gibbon (_Hylobates concolor_) emits in leisurely succession a low staccato, whistle-like cry, like "Hoot! Hoot! Hoot!" which one can easily counterfeit by whistling. This is varied by another whistle cry of three notes, thus: "Who-ee-hoo! Who-ee-hoo!" also to be duplicated by whistling. In hunting for specimens of that gibbon, for American museums, I could rarely locate a troop save by the tree-top talk of its members.

But all this was only childish prattle in comparison with the daily performances of the big white-handed, and the black hoolock gibbons, now and for several years past residing in our Primate House. Every morning, and perhaps a dozen times during the day,

those three gibbons go on a vocal rampage and utter prolonged and ear-splitting cries and shrieks that make the welkin ring. The shrieking chorus is usually prolonged until it becomes tiresome to the monkeys. In all our ape and monkey experience we never have known its equal save in the vocal performances of Boma, our big adult male chimpanzee, the husband of Suzette.

A baboon emits occasionally, and without any warning, a fearful explosive bark, or roar, that to visitors is as startling as the report of a gun. The commonest expressions are "Wah!" and "_Wah' _hoo!", and the visitor who can hear it close at hand without jumping has good nerves.

The big and solemn long-nosed monkey of Borneo (_Nasalis larvatus_) utters in his native tree-top (overhanging water), a cry like the resonant "honk" of a saxophone. He says plainly, "Kee honk," and all that I could make of its meaning was that it is used as the equivalent of "All's well."

Of all the monkeys that I have ever known, either wild or in captivity, the red howlers of the Orinoco, in Venezuela, have the most remarkable voices, and make the most remarkable use of them. The hyoid cartilage is expanded,--for Nature's own particular reasons,--into a wonderful sound-box, as big as an English walnut, which gives to the adult voice a depth of pitch and a booming resonance that is impossible to describe. The note produced is a prolonged bass roar, in alternately rising and falling cadence, and in reality comprising about three notes. It is the habit of troops of red howlers to indulge in nocturnal concerts, wherein four, five or six old males will pipe up and begin to howl in unison. The great volume of uncanny sound thus produced goes rolling through the still forest, far and wide; and to the white explorer who lies in his grass hammock in pitchy darkness, fighting off the mosquitoes and loneliness, and wondering from whence tomorrow's meals will come, the moral effect is gruesome and depressing.

In captivity the youthful howler habitually growls and grumbles in a way that is highly amusing, and the absurd pitch of the deep bass voice issuing from so small an animal is cause for wonder.

It is natural that we should look closely to the apes and monkeys for language, both by voice and sign. In 1891 there was a flood of talk on "the speech of monkeys," and it was not until about 1904 that the torrent stopped. At first the knowledge that monkeys can and do communicate to a limited extent by vocal sounds was hailed as a "discovery"; but unfortunately for science, nothing has been proved beyond the long-known fact that primates of a given species understand the meaning of the few sounds and cries to which their kind give utterance.

Thus far I have never succeeded in teaching a chimpanzee or orangutan to say even as much as "Oh" or "Ah." Nothing seems to be further from the mind of an orang than the idea of a new vocal utterance as a means to an end.

Our Polly was the most affectionate and demonstrative chimpanzee that I have ever seen, and her reaction to my voice was the best that I have found in our many apes. She knew me well, and when I

greeted her in her own language, usually she answered me promptly and vociferously. Often when she had been busy with her physical-culture exercises and Delsartean movements on the horizontal bars or the trapeze in the centre of her big cage, I tested her by quietly joining the crowd of visitors in the centre of the room before her cage, and saying to her: "Polly! Wah! Wah! Wah!"

Nearly every time she would stop short, give instant attention and joyously respond "Wah! Wah! Wah!", repeating the cry a dozen times while she clambered down to the lower front bars to reach me with her hands. When particularly excited she would cry "_Who_-oo! _Who_-oo! _Who_-oo!" with great clearness and vehemence, the two syllables pitched four notes apart. This cry was uttered as a joyous greeting, and also at feeding-time, in expectation of food; but, simple as the task seems to be, I really do not know how to translate its meaning into English. In one case it appears to mean "How do you do?" and in the other it seems to stand for "Hurry up!"

Polly screamed when angry or grieved, just like a naughty child; and her face assumed the extreme of screaming-child expression. She whined plaintively when coaxing, or when only slightly grieved. With these four manifestations her vocal powers seemed to stop short. Many times I opened her mouth widely with my fingers, and tried to surprise her into saying "Ah," but with no result. It seems almost impossible to stamp the vocal-sound idea upon the mind of an orang-utan or chimpanzee. Polly uttered two distinct and clearly cut syllables, and it really seemed as if her vocal organs could have done more if called upon.

The cries of the monkeys, baboons and lemurs are practically nothing more than squeals, shrieks or roars. The baboons (several species, at least) bark or roar most explosively, using the syllable "Wah!" It is only by the most liberal interpretation of terms that such cries can be called language. The majority express only two emotions--dissatisfaction and expectation. Every primate calls for help in the same way that human beings do, by shrill screaming; but none of them ever cry "Oh" or "Ah."

The only members of the monkey tribe who ever spoke to me in their native forests were the big black langurs of the Animallai Hills in Southern India. They used to glare down at us, and curse us horribly whenever we met. Had we been big pythons instead of men they could not have said "Confound you!" any more plainly or more vehemently than they did.

In those museum-making days our motto was "All's fish that cometh to net"; and we killed monkeys for their skins and skeletons the same as other animals. My brown-skinned Mulcer hunters said that the bandarlog hated me because of my white skin. At all events, as we stalked silently through those forests, half a dozen times a day we would hear an awful explosion overhead, startling to men who were still-hunting big game, and from the middle zone of the tree-tops black and angry faces would peer down at us. They said: "Wah! Wah! Wah! Ah-^oo-oo-Aoo-oo-^oo-oo!" and it was nothing else than cursing and blackguarding. How those monkeys did hate us! I never have encountered elsewhere anything like it in monkey-land. In 1902 there was a startling exhibition of monkey language at our Primate House. That was before the completion of the Lion House.

We had to find temporary outdoor quarters for the big jaguar, "Senor Lopez"; and there being nothing else available, we decided to place him, for a few days only, in the big circular cage at the north end of the range of outside cages. It was May, and the baboons, red-faced monkeys, rhesus, green and many other of the monkeys were in their outside quarters.

I was not present when Lopez was turned into the big cage; but I heard it. Down through the woods to the polar bears' den, a good quarter of a mile, came a most awful uproar, made by many voices. The bulk of it was a medley of raucous yells and screeches, above which it was easy to distinguish the fierce, dog-like barks and roars of the baboons.

We knew at once that Lopez had arrived. Hurrying up to the Primate House, we found the wire fronts of the outside cages literally plastered with monkeys and baboons, all in the wildest excitement. The jaguar was in full view of them, and although not one out of the whole lot, except the sapajous, ever had an ancestor who had seen a jaguar, one and all recognized a hostile genus, and a hereditary enemy.

And how they cursed him, reviled him, and made hideous faces at him! The long-armed yellow baboons barked and roared until they were heard half a mile away. The ugly-tempered macaques and rhesus monkeys nearly burst with hatred and indignation. The row was kept up for a long time, and the monkey language that was lost to science on that occasion was, both in quantity and quality, beyond compare.

Bear Language. In their native haunts bears are as little given to loud talk as other animals; but in roomy and comfortable captivity, where many are yarded together, they rapidly develop vocal powers. Our bears are such cheerful citizens, and they do so many droll things, that the average visitor works overtime in watching them. I have learned the language of our bears sufficiently that whenever I hear one of them give tongue I know what he says. For example:

In warning or threatening an enemy, the sloth bear says: "Ach! Ach! Ach!" and the grizzly says: "Woof! Woof!" A fighting bear says: "Aw-aw-aw!" A baby's call for its mother is "Row! Row!" A bear's distress call is: "Err- _wow_ -oo-oo-oof!"

But even in a zoological park it is not possible for everyone to recognize and interpret the different cries of bears, although the ability to do so is sometimes of value to the party of the second part. For example:

One day in February I was sitting in my old office in the Service Building, engrossed in I know not what important and solemn matter. The park was quiet; for the snow lay nine inches deep over all. There were no visitors, and the maintenance men were silently shovelling. Over the hill from the bear dens came the voice of a bear. It said, as plainly as print: "Err-wow!" I said to myself: "That sounds like a distress call," and listened to hear it repeated.

Again it came: "Err-wow!"

I caught up my hat and hastened over the hill toward the bear dens. On the broad concrete walk, about a hundred feet from the dens, four men were industriously shovelling snow, unaware that anything was wrong anywhere except on the pay-roll, opposite their names.

Guided by the cries that came from "The Nursery" den, where six yearling cubs were kept, I quickly caught sight of the trouble. One of our park-born brown bear cubs was hanging fast by one forefoot from the top of the barred partition. He had climbed to the top of the ironwork, thrust one front paw through between two of the bars (for bears are the greatest busybodies on earth), and when he sought to withdraw it, the sharp point of a bar in the overhang of the tree-guard had buried itself in the back of his paw, and held him fast. It seemed as if his leg was broken, and also dislocated at the shoulder. No wonder the poor little chap squalled for help. His mother, on the other side of the partition, was almost frantic with baffled sympathy, for she could do nothing to help him.

It did not take more than a quarter of a minute to have several men running for crowbars and other things, and within five minutes from the discovery we were in the den ready for action. The little chap gave two or three cries to let us know how badly it hurt his leg to hang there, then bent his small mind upon rendering us assistance.

First we lifted him up bodily, and held him, to remove the strain. Then, by good luck, we had at hand a stout iron bar with a U-shaped end; and with that under the injured wrist, and a crowbar to spring the treacherous overhang, we lifted the foot clear, and lowered little Brownie to the floor. From first to last he helped us all he could, and seemed to realize that it was clearly "no fair" to bite or scratch. Fortunately the leg was neither broken nor dislocated, and although Brownie limped for ten days, he soon was all right again.

After the incident had been closed, I gave the men a brief lecture on the language of bears, and the necessity of being able to recognize the distress call.

You can chase bison, elephants and deer all day without hearing a single vocal utterance. They know through long experience the value of silence.

The night after I shot my second elephant we noted an exception. The herd had been divided by our onslaught. Part of it had gone north, part of it south, and our camp for the night (beside the dead tusker) lay midway between the two. About bedtime the elephants began signalling to each other by trumpeting, and what they sounded was "The assembly." They called and answered repeatedly; and finally it became clear to my native followers that the two herds were advancing to unite, and were likely to meet in our vicinity. That particular trumpet call was different from any other I have ever heard. It was a regular "Hello" signal-call, entirely different from the "Tal-_loo_-e" blast which once came from a feeding herd and guided us to it.

But it is only on rare occasions that elephants communicate with each other by sound. I once knew a general alarm to be communicated throughout a large herd by the sign language, and a retreat organized and carried out in absolute silence. Their danger signals to each other must have been made with their trunks and their ears; but we saw none of them, because all the animals were concealed from our view except when the two scouts of the herd were hunting for us.

In captivity an elephant trumpets in protest, or through fear, or through rage; but I am obliged to confess that as yet I cannot positively distinguish one from the other.

Once in the Zoological Park I heard our troublesome Indian elephant, Alice, roaring continuously as if in pain. It continued at such a rate that I hurried over to the Elephant House to investigate. And there I saw a droll spectacle. Keeper Richards had taken Alice out into her yard for exercise and had ordered her to follow him. And there he was disgustingly marching around the yard while Alice marched after him at an interval of ten paces, quite free and untrammelled, but all the while lustily trumpeting and roaring in indignant protest. The only point at which she was hurt was in her feelings.

Two questions that came into public notice concerning the voices of two important American animals have been permanently settled by "the barnyard naturalists" of New York.

The Voice of the American Bison. In 1907 the statement of George Catlin, to the effect that in the fall the bellowing of buffalo bulls on the plains resembled the muttering of distant thunder, was denied and severely criticized in a sportsman's magazine. On October 4 of that year, while we were selecting the fifteen bison to be presented to the Government, to found the Wichita National Bison Herd, four of us heard our best bull _bellow_ five times, while another did the same thing four times.

The sound uttered was a deep-voiced roar,--not a grunt,--rising and falling in measured cadence, and prolonged about four or five seconds. It was totally different from the ordinary grunt of hunger, or the menace of an angry buffalo, which is short and sharp. In discussing the quality of the bellow, we agreed that it could properly be called a low roar. It is heard only in the rutting season,--the period described by Catlin,--and there is good reason to believe that Catlin's description is perfectly correct.

The Scream of the Puma. This is a subject that will not lie still. I presume it will recur every five years as long as pumas endure. Uncountable pages of controversial letters have been expended upon the question: "Does the puma ever scream, like a woman in distress?"

The true answer is easy, and uncontested by people whose minds are open to the rules of evidence.

Yes; the adult female puma DOES scream,--_in the mating season_, whenever it comes. It is loud, piercing, prolonged, and has the agonized voice qualities of a boy or a woman screaming

from the pain of a surgical operation. To one who does not know the source or the cause, it is nerve-racking. When heard in a remote wilderness it must be truly fearsome. It says "Ow-w-w-w!" over and over. We have heard it a hundred times or more, and it easily carries a quarter of a mile.

The language of animals is a long and interesting subject,--so much so that here it is possible only to sketch out and suggest its foundations and scope. On birds alone, an entire volume should be written; but animal intelligence is a subject as far reaching as the winds of the earth.

No man who ever saw high in the heavens a V-shaped flock of wild geese, or heard the honk language either afloat, ashore or in the air, will deny the spoken language of that species. If any one should do so, let him listen to the wild-goose wonder tales of Jack Miner, and hear him imitate (to perfection) the honk call of the gander at his pond, calling to wild flocks in the sky and telling them about the corn and safety down where he is.

The woodpecker drums on the high and dry limb of a dead tree his resounding signal-call that is nothing more nor less (in our view) than so much sign language.

It was many years ago that we first heard in the welcome days of early spring the resounding _"Boo-hoo-hoo"_ courting call of the cock pinnated grouse, rolling over the moist earth for a mile or more in words too plain to be misunderstood.

The American magpie talks beautifully; but I regret to say that I do not understand a word of its language. One summer we had several fine specimens in the great flying-cage, with the big and showy waterfowl, condor, griffon vulture, ravens and crows. One of those magpies often came over to the side of the cage to talk to me, and as I believe, make complaints. Whether he complained about his big and bulky cagemates, or the keepers, or me, I could not tell; but I thought that his grievances were against the large birds. Whenever I climbed over the guard rail and stooped down, he would come close up to the wire, stand in one spot, and in a quiet, confidential tone talk to me earnestly and gesticulate with his head for five minutes straight. I have heard senile old men run on in low-voiced, unintelligible clack in precisely the same way. The modulations of that bird's voice, its inflections and its vocabulary were wonderful. From his manner a messenger from Mars might easily have inferred that the bird believed that every word of the discourse was fully understood.

The lion roars, magnificently. The hyena "laughs"; the gray wolf gives a mournful howl, the coyote barks and howls, and the fox yaps. The elk bugles, the moose roars and bawls, in desire or defiance. The elephant trumpets or screams in the joy of good feeding, or in fear or rage; and it also rumbles deeply away down in its throat. The red squirrel barks and chatters, usually to scold some one whom he hates, but other small rodents know that silence is golden.

The birds have the best voices of all creatures. They are the sweet singers of the animal world, and to the inquiring mind that field is a wonderland.

The frogs are vociferous; and now if they were more silent they would last longer.

Of all the reptiles known to me, only two utter vocal sounds,--the alligator and the elephant tortoise. The former roars or bellows, the latter grunts.

IV

THE MOST INTELLIGENT ANIMALS

To the professional animal-man, year in and year out comes the eternal question, "Which are the most intelligent animals?"

The question is entirely legitimate. What animals are the best exponents of animal intelligence?

It seems to me that the numerous factors involved, and the comparisons that must be made, can best be expressed in figures. Opinions that are based upon only one or two sets of facts are not worth much. There are about ten factors to be taken into account and appraised separately.

In order to express many opinions in a small amount of space, we submit a table of estimates and summaries, covering a few mammalian species that are representative of many. But, try as they will, it is not likely that any two animal men will set down the same estimates. It all depends upon the wealth or the poverty of first-hand, eye-witness evidence. When we enter the field of evidence that must stand in quotation marks, we cease to know where we will come out. We desire to state that nearly all of the figures in the attached table of estimates are based upon the author's own observations, made during a period of more than forty years of ups and downs with wild animals. **ESTIMATES OF THE COMPARATIVE INTELLIGENCE AND ABILITY OF CERTAIN CONSPICUOUS WILD ANIMALS, BASED UPON KNOWN PERFORMANCES, OR THE ABSENCE OF THEM.** [Footnote: To the author, correspondence regarding the reasons for these estimates is impossible.]

[beginning of chart]

Perfection in all=100 [list of categories below are written vertically above the columns, with the last column unnamed and representing a total score of animal intelligence/1000]

Hereditary Knowledge Perceptive Faculties Original Thought Memory
Reason Receptivity in Training Efficiency in Execution Nervous
Energy Keeness of the Senses Use of the Voice

Primates

Chimpanzee	100	100	100	100	75	100	100	100	100	50	925
Orang-Utan	100	100	100	75	100	75	100	75	100	25	850
Gorilla.	50	50	50	50	75	25	25	50	100	25	500

Ungulates

Indian Elephant100 100 100 100 100 100 100 100 75 50 25 850
Rhinoceros.25 25 25 25 25 0 0 25 25 0 175
Giraffe50 25 25 25 25 25 0 25 100 0 300
White-Tailed Deer . . .100 100 100 25 50 0 0 100 100 0 575
Big-Horn Sheep100 100 50 25 50 0 0 100 100 0 525
Mountain Goat.100 100 100 25 100 0 0 100 100 0 625
Domestic Horse.100 100 100 75 75 75 75 100 100 50 850

Carnivores

Lion100 100 50 75 50 75 50 100 100 25 725
Tiger100 75 50 50 50 25 25 100 100 0 575
Grizzly Bear100 100 50 25 50 75 50 75 100 25 725
Brown Bear (European)100 100 50 25 50 75 50 75 100 25 650
Gray Wolf100 100 100 25 75 00 100 100 25 625
Coyote100 75 50 25 50 0 0 75 100 25 500
Red Fox100 100 50 75 100 0 0 100 100 25 650
Domestic Dog50 100 75 75 75 75 100 100 100 100 850
Wolverine100 100 100 25 100 0 75 100 100 0 700

Beaver100 100 100 25 100 0 100 100 100 0 725

According to the author's information and belief, _these are "the most intelligent" animals:_ The Chimpanzee is the most intelligent of all animals below man. His mind approaches most closely to that of man, and it carries him farthest upward toward the human level. He can learn more by training, and learn more easily, than any other animal.

The Orang-Utan is mentally next to the chimpanzee.

The Indian Elephant in mental capacity is third from man.

The high-class domestic Horse is a very wise and capable animal; but this is chiefly due to its age-long association with man, and education by him. Mentally the wild horse is a very different animal, and in the intellectual scale it ranks with the deer and antelopes.

The Beaver manifests, in domestic economy, more intelligence, mechanical skill and reasoning power than any other wild animal.

The Lion is endowed with keen perceptive faculties, reasoning ability and judgment of a high order, and its mind is surprisingly receptive.

The Grizzly Bear is believed to be the wisest of all bears.

The Pack Rat (_Neotoma_) is the intellectual phenomenon of the great group of gnawing animals. It is in a class by itself.

The White Mountain Goat seems to be the wisest of all the mountain summit animals whose habits are known to zoologists and sportsmen.

A high-class Dog is the animal that mentally is in closest touch

with the mind, the feelings and the impulses of man; and it is the only one that can read a man's feelings from his eyes and his facial expression.

The Marvelous Beaver. Let us consider this animal as an illuminating example of high-power intelligence.

In domestic economy the beaver is the most intelligent of all living mammals. His inherited knowledge, his original thought, his reasoning power and his engineering and mechanical skill in constructive works are marvelous and beyond compare. In his manifold industrial activities, there is no other mammal that is even a good second to him. He builds dams both great and small, to provide water in which to live, to store food and to escape from his enemies. He builds air-tight houses of sticks and mud, either as islands, or on the shore. When he cannot live as a pond-beaver with a house he cheerfully becomes a river-beaver. He lives in a river-bank burrow when house-building in a pond is impossible; and he will cheerfully tunnel under a stone wall from one-pond monotony, to go exploring outside.

[Illustration: CHRISTMAS AT THE PRIMATES' HOUSE Chimpanzees (with large ears) and orang-utans (small ears). The animal on the extreme right is an orang of the common caste]

He cuts down trees, both small and large, and he makes them fall as he wishes them to fall. He trims off all branches, and leaves no "slash" to cumber the ground. He buries green branches, in great quantity, in the mud at the bottom of his pond, so that in winter he can get at them under a foot of solid ice. He digs canals, of any length he pleases, to float logs and billets of wood from hinterland to pond.

If you are locating beavers in your own zoo, and are wise, you can induce beavers to build their dam where you wish it to be. This is how we did it!

We dug out a pond of mud in order that the beavers might have a pond of water; and we wished the beavers to build a dam forty feet long, at a point about thirty feet from the iron fence where the brook ran out. On thinking it over we concluded that we could manage it by showing the animals where we wished them to go to work.

We set a 12-inch plank on its edge, all the way across the dam site, and pegged it down. Above it the water soon formed a little pool and began to flow over the top edge in a very miniature waterfall. Then we turned loose four beavers and left them.

The next morning we found a cart-load of sticks and fresh mud placed like a dam against the iron fence. In beaver language this said to us:

"We would rather build our dam here,--if you don't mind. It will be easier for us, and quicker."

We removed all their material; and in our language that action said: "No; we would rather have you build over the plank."

The next night more mud and sticks piled against the fence said to us,

"We really insist upon building it here!"

We made a second clearance of their materials, saying in effect:

"You shall not build against the fence! You must build where we tell you!"

Thereupon, the beavers began to build over the plank, saying,

"Oh, well, if you are going to make a fuss about it, we will let you have your way."

So they built a beautiful water-tight dam precisely where we suggested it to them, and after that our only trouble was to keep them from overdoing the matter, and flooding the whole valley.

I am not going to dwell upon the mind and manners of the beaver. The animal is well known. Three excellent books have been written and pictured about him, in the language that the General Reader understands. They are as follows: "The American Beaver and His Works," Lewis H. Morgan (1868); "The Romance of the Beaver," A. R. Dugmore (no date); "History and Traditions of the Canada Beaver," H. T. Martin (1892).

"Clever Hans," the "Thinking Horse." From 1906 to 1910 the world read much about a wonderful educated horse owned and educated by Herr von Osten, in Germany. The German scientists who first came in touch with "Hans" were quite bowled over by the discovery that that one horse could "think." The Review of Reviews said, in 1910:

"It may be recalled that Clever Hans knew figures and letters, colors and tones, the calendar and the dial, that he could count and read, deal with decimals and fractions, spell out answers to questions with his right hoof, and recognize people from having seen their photographs. In every case his 'replies' were given in the form of scrapings with his right forehoof.

"Whether the questioner was von Osten, who had worked with him for seven years, or a man like Schillings, who was a complete stranger, seemed immaterial; and this went farthest, perhaps, in disposing of all talk of 'collusion' between master and beast."

Now, by the bald records of the case the fact was fixed for all time that Hans was the most wonderful mental prodigy that ever bore the form of a four-footed animal. His learning and his performances were astounding, and even uncanny. I do not care how he was trained, nor by what process he received ideas and reacted to them! He was a phenomenon, and I doubt whether this world ever sees his like again. His mastery of figures alone, no matter how it was wrought, was enough to make any animal or trainer illustrious.

But eventually Clever Hans came to grief. He was ostensibly thrown off his pedestal, in Germany, by human jealousy and

egotism. Several industrious German scientists deliberately set to work to discredit him, and they stuck to it until they accomplished that task. The chief instrument in this was no less a man than the director of the "Psychological Institute" of the Berlin University, Professor Otto Pfungst. He found that when Hans was put on the witness stand and subjected to rigid cross examinations _by strangers_, his answers were due partly to _telepathy and hypnotic influence_! For example, the discovery was made that Hans could not always give the correct answer to a problem in figures unless it was known to the questioner himself.

To Hans's inquisitors this discovery imparted a terrible shock. It did not look like "thinking" after all! The mental process was _different_ from the process of the German mind! The wonderful fact that Hans could remember and recognize and _reproduce_ the ten digits was entirely lost to view. At once a shout went up all over Germany,--in the scientific circle, that Hans was an "impostor," that he could not "think," and that his mind was nothing much after all.

Poor Hans! The glory that should have been his, and imperishable, is gone. He was the victim of scientists of one idea, who had no sense of proportion. He truly WAS a thinking horse; and we are sure that there are millions of men whose minds could not be developed to the point that the mind of that "dumb" animal attained,--no, not even with the aid of hypnotism and telepathy.

The bare fact that a horse _can_ be influenced by occult mental powers proves the close parallelism that exists between the brains of men and beasts. The Trap-Door Spider. Let no one suppose for one moment that animal mind and intelligence is limited to the brain-bearing vertebrates. The scope and activity of the notochord in some of the invertebrates present phenomena far more wonderful per capita than many a brain produces. Interesting books have been written, and more will be written hereafter, on the minds and doings of ants, bees, wasps, spiders and other insects.

Consider the ways and means of the ant-lion of the East, and the trap-door spider of the western desert regions. As one object lesson from the insect world, I will flash upon the screen, for a moment only, the trap-door spider. This wonderful insect personage has been exhaustively studied by Mr. Raymond L. Ditmars, in the development of a series of moving pictures, and at my request he has contributed the following graphic description of this spider's wonderful work.

"The trap-door spiders, inhabiting the warmer portions of both the Old and New Worlds, dig a deep tunnel in the soil, line this with a silken wallpaper, then construct a hinged door at the top so perfectly fitted and camouflaged with soil, that when it is closed there is no indication of the burrow. Moreover, the inside portion of the door of some species is so constructed that it may be "latched," there being two holes near the edge, precisely placed where the curved fangs may be inserted and the door held firmly closed. Also, the trap-door of a number of species is so designed as to be absolutely rain-proof, being bevelled and as accurately

fitting a corresponding bevel of the tube as the setting of a compression valve of a gasoline engine.

[Illustration: THE TRAP-DOOR

SPIDER'S DOOR AND BURROW By R. L. Ditmars 1. The door closed. Its top carefully counterfeits the surrounding ground. 2. The door with silken hinge, held open by a needle. 3. The spider in its doorway, looking for prey. 4. Section of the burrow and trap-door.]

"The study of a number of specimens of our southern California species, which builds the cork-type door, including observations of them at night, when they are particularly active, indicates that the construction of the tube involves other material than the silken lining employed by many burrowing spiders. In the excavation of the tube and retention of the walls, the spider appears to employ a glairy substance, which thoroughly saturates the soil and renders the interior of the tube of almost cement-like hardness. It is then plastered with a thick jet of silk from the spinning glands. This interior finishing process appears to be quite rapid, a burrow being readily lined within a couple of hours.

"The construction of the trap-door is a far more complicated process, this convex, beautifully bevelled entrance with its hinge requiring real scientific skill. Judging from observations on a number of specimens, the work is done from the outside, the spider first spinning a net-like covering over the mouth of the tube. This is thickened by weaving the body over the net, each motion leaving a smoky trail of silk. Earth is then shoveled into the covering, the spider carefully pushing the particles toward the centre, which soon sags, and assumes the proper curvature, and automatically moulds against the bevelled walls of the tube.

"The shoveling process must be nicely regulated to produce the proper bevel and thickness of the door. Then the cementing process is applied to the top, rendering the door a solid unit. From the actions of these spiders,--which often calmly rest an hour without a move,--it appears that the edges of the door are now subjected, by the stout and sharp fangs, to a cutting process like that of a can opener, leaving a portion of the marginal silk to act as a hinge. This hinge afterward receives some finishing touches, and the top of the door is either pebbled or finished with a few fragments of dead vegetation, cemented on, in order to exactly match the surrounding soil."

V

THE RIGHTS OF WILD ANIMALS

Every harmless wild bird and mammal has the right to live out its life according to its destiny; and man is in honor bound to respect those rights. At the same time it is a mistake to regard each wild bird or quadruped as a sacred thing, which under no circumstances may be utilized by man. We are not fanatical Hindus

of the castes which religiously avoid the "taking of life" of any kind, and gently push aside the flea, the centipede and the scorpion. The reasoning powers of such people are strictly limited, the same as those of people who are opposed to the removal by death of the bandits and murderers of the human race.

The highest duty of a reasoning being is to reason. We have no moral or legal right to act like idiots, or to become a menace to society by protecting criminal animals or criminal men from adequate punishment. Like the tree that is known by its fruit, every alleged "reasoning being" is to be judged by the daily output of his thoughts.

Toward wild life, our highest duty is to be sane and sensible, in order to be just, and to promote the greatest good for the greatest number. Be neither a Hindu fanatic nor a cruel game-butcher like a certain wild-animal slaughterer whom I knew, who while he was on earth earned for himself a place in the hottest corner of the hereafter, and quickly passed on to occupy it.

The following planks constitute a good platform on which to base our relations with the wild animal world, and by which to regulate our duty to the creatures that have no means of defense against the persecutions of cruel men. They may be regarded as representing the standards that have been fixed by enlightened and humane civilization.

THE WILD ANIMALS' BILL OF RIGHTS

This Bill of Rights is to be copied and displayed conspicuously in all zoological parks and gardens, zoos and menageries; in all theatres and shows where animal performances are given, and in all places where wild animals and birds are trained, sold or kept for the pleasure of their owners.

Article 1. In view of the nearness of the approach of the higher animals to the human level, no just and humane man can deny that those wild animals have certain rights which man is in honor bound to respect.

Art. 2. The fact that God gave man "dominion over the beasts of the field" does not imply a denial of animal rights, any more than the supremacy of a human government conveys the right to oppress and maltreat its citizens.

Art. 3. Under certain conditions it is justifiable for man to kill a limited number of the so-called game animals, on the same basis of justification that domestic animals and fowls may be killed for food.

Art. 4. While the trapping of fur-bearing animals is a necessary evil, that evil must be minimized by reducing the sufferings of trapped animals to the lowest possible point, and by preventing wasteful trapping.

Art. 5. The killing of harmless mammals or birds solely for "sport," and without utilizing them when killed, is murder; and no good and humane man will permit himself to engage in any such offenses against good order and the rights of wild creatures.

Art. 6. Shooting at sea-going creatures from moving vessels, without any possibility of securing them if killed or wounded, is cruel, reprehensible, and criminal, and everywhere should be forbidden by ship captains, and also by law, under penalties.

Art. 7. The extermination of a harmless wild animal species is a crime; but the regulated destruction of wild pests that have been proven guilty, is sometimes necessary and justifiable.

Art. 8. No group or species of birds or mammals that is accused of offenses sufficiently grave to merit destruction shall be condemned undefended and unheard, nor without adequate evidence of a character which would be acceptable in a court of law.

Art. 9. The common assumption that every bird or mammal that offends, or injures the property of any man, is necessarily deserving of death, is absurd and intolerable. The death penalty should be the last resort, not the first one!

Art. 10. Any nation that fails adequately to protect its crop-and-tree-protecting birds deserves to have its fields and forests devastated by predatory insects.

Art. 11. No person has any moral right to keep a wild mammal, bird, reptile or fish in a state of uncomfortable, unhappy or miserable captivity, and all such practices should be prevented by law, under penalty. It is entirely feasible for a judge to designate a competent person as a referee to examine and decide upon each case.

Art. 12. A wild creature that cannot be kept in comfortable captivity should not be kept at all; and the evils to be guarded against are cruelly small quarters, too much darkness, too much light, uncleanness, bad odors, and bad food. A fish in a glass globe, or a live bird in a cage the size of a collar-box is a case of cruelty.

Art. 13. Every captive animal that is suffering hopelessly from disease or the infirmities of old age has the right to be painlessly relieved of the burdens of life.

Art. 14. Every keeper or owner of a captive wild animal who through indolence, forgetfulness or cruelty permits a wild creature in his charge to perish of cold, heat, hunger or thirst because of his negligence, is guilty of a grave misdemeanor, and he should be punished as the evidence and the rights of captive animals demand.

Art. 15. An animal in captivity has a right to do all the damage to its surroundings that it can do, and it is not to be punished therefor.

Art. 16. The idea that all captive wild animals are necessarily "miserable" is erroneous, because some captive animals are better fed, better protected and are more happy in captivity than similar animals are in a wild state, beset by dangers and harassed by hunger and thirst. It is the opinion of the vast majority of civilized people that there is no higher use to which a wild bird

or mammal can be devoted than to place it in perfectly comfortable captivity to be seen by millions of persons who desire to make its acquaintance.

Art. 17. About ninety-five per cent of all the wild mammals seen in captivity were either born in captivity or captured when in their infancy, and therefore have no ideas of freedom, or visions of their wild homes; consequently their supposed "pining for freedom" often is more imaginary than real.

Art. 18. A wild animal has no more inherent right to live a life of lazy and luxurious ease, and freedom from all care, than a man or woman has to live without work or family cares. In the large cities of the world there are many millions of toiling humans who are worse off per capita as to burdens and sorrows and joys than are the beasts and birds in a well kept zoological park. "Freedom" is comparative only, not absolute.

Art. 19. While the use of trained animals in stage performances is not necessarily cruel, and while training operations are based chiefly upon kindness and reward, it is necessary that vigilance should be exercised to insure that the cages and stage quarters of such animals shall be adequate in size, properly lighted and acceptably ventilated, and that cruel punishments shall not be inflicted upon the animals themselves.

Art. 20. The training of wild animals may, or may not, involve cruelties, according to the intelligence and the moral status of the trainer. This is equally true of the training of children, and the treatment of wives and husbands. A reasonable blow with a whip to a mean and refractory animal in captivity is not necessarily an act of cruelty. Every such act must be judged according to the evidence.

Art. 21. It is unjust to proclaim that "all wild animal performances are cruel" and therefore should be prohibited by law. The claim is untrue, and no lawmaker should pay heed to it. Wild animal performances are no more cruel or unjust than men-and-women performances of acrobatics. Practically all trained animals are well fed and tended, they welcome their performances, and go through them with lively interest. Such performances, when good, have a high educational value,--but not to closed minds.

Art. 22. Every bull-fight, being brutally unfair to the horses and the bull engaged and disgustingly cruel, is an unfit spectacle for humane and high-minded people, and no Christian man or woman can attend one without self-stultification.

Art. 23. The western practice of "bulldogging," now permitted in some Wild West shows, is disgusting, degrading, and never should be permitted.

Art. 24. The use of monkeys by organ-grinders is cruel, it is degrading to the monkeys, and should in all states be prohibited by law.

Art. 25. The keeping of live fishes in glass globes nearly always ends in cruelty and suffering, and should everywhere be prohibited by law. A round glass straight-jacket is just as painful as any

other kind.

Art. 26. The sale and use of chained live chameleons as ornaments and playthings for idiotic or vicious men and children always means death by slow torture for the reptile, and should in all states be prohibited by law.

II. MENTAL TRAITS OF WILD ANIMALS

VI

THE BRIGHTEST MINDS AMONG AMERICAN ANIMALS

We repeat that _the most interesting features of a wild animal are its mind, its thoughts, and the results of its reasoning._ Besides these, its classification, distribution and anatomy are of secondary importance; but at the same time they help to form the foundation on which to build the psychology of species and individuals. Let no student make the mistake of concluding that when he has learned an animal's place in nature there is nothing more to pursue.

After fifty years of practical experience with wild animals of many species, I am reluctantly compelled to give the prize for greatest cunning and foresight _in self-preservation_ to the common brown rat,--the accursed "domestic" rat that has adopted man as his perpetual servant, and regards man's goods as his lawful prey. When all other land animals have been exterminated from the earth, the brown rat will remain, to harry and to rob the Last Man.

The brown rat has persistently accompanied man all over the world. Millions have been spent in fighting him and the bubonic-plague flea that he cheerfully carries in his offensive fur. For him no place _that contains food_ is too hot or too cold, too wet or too dry. Many old sailors claim to believe that rats will desert at the dock an outward-bound ship that is fated to be lost at sea; but that certificate of superhuman foreknowledge needs a backing of evidence before it can be accepted.

Of all wild animals, rats do the greatest number of "impossible" things. We have matched our wits against rat cunning until a madhouse yawned before us. Twice in my life all my traps and poisons have utterly failed, and left me faintly asking: _Are_ rats possessed of occult powers? Once the answer to that was furnished by an old he-one who left his tail in my steel trap, but a little later _caught himself_ in a trap-like space in the back of the family aeolian, and ignominiously died there,--a victim of his own error in judging distances without a tape line.

Tomes might be written about the minds and manners of the brown rat, setting forth in detail its wonderful intelligence in quickly getting wise to new food, new shelter, new traps and new poisons. Six dead rats are, as a rule, sufficient to put any _new_

trap out of business; but poisons and infections go farther before being found out. [Footnote: For home use, my best rat weapon is rough-on-rats, generously mixed with butter and spread liberally on very thin slices of bread. It has served me well in effecting clearances.]

The championship for keen strategy in self-preservation belongs to the musk-oxen for their wolf-proof circle of heads and horns. Every musk-ox herd is a mutual benefit life insurance company. When a gaunt and hungry wolf-pack appears, the adult bull and cow musk-oxen at once form a close circle, with the calves and young stock in the centre. That deadly ring of lowered heads and sharp horns, all hung precisely right to puncture and deflate hostile wolves, is impregnable to fang and claw. The arctic wolves know this well. Mr. Stefansson says it is the settled habit of wolf packs of Banks Land to pass musk-ox herds without even provoking them to "fall in" for defense.

Judging by the facts that Charles L. Smith and the Norboe brothers related to Mr. Phillips and me around our camp-fires in the Canadian Rockies, the wolverine is one of the most cunning wild animals of all North America. This is a large order; for the gray wolf and grizzly bear are strong candidates for honors in that contest.

The greatest cunning of the wolverine is manifested in robbing traps, stealing the trapper's food and trap-baits, and at the same time avoiding the traps set for him. He is wonderfully expert in springing steel traps for the bait or prey there is in them, without getting caught himself. He will follow up a trap line for miles, springing all traps and devouring all baits as he goes. Sometimes in sheer wantonness he will throw a trap into a river, and again he will bury a trap in deep snow. Dead martens in traps are savagely torn from them. Those that can not be eaten on the spot are carried off and skilfully cached under two or three feet of snow.

Trapper Smith once set a trap for a wolverine, and planted close behind it a young moose skull with some flesh upon it. The wolverine came in the night, started at a point well away from the trap, dug a tunnel through six feet of snow, fetched up well behind the trap,--and triumphantly dragged away the head through his tunnel.

From the testimony of W. H. Wright, of Spokane, in his interesting book on "The Grizzly Bear," and for other reasons, I am convinced that the Rocky Mountain silver-tip grizzly is our brightest North American animal, and very keen of nose, eye, ear and brain. Mr. Wright says that "the grizzly bear far excels in cunning any other animal found throughout the Rocky Mountains, and, for that matter, he far excels them all combined." While the last clause is a large order, I will not dispute the opinion of a man of keen intelligence who has lived much among the most important and interesting wild animals of the Rockies.

In the Bitter Root Mountains Mr. Wright and his hunting party once set a bear trap for a grizzly, in a pen of logs, well baited with fresh meat. On the second day they found the pen demolished, the bait taken out, and everything that was movable piled on the top

of the trap.

The trap was again set, this time loosely, under a bed of moss. The grizzly came and joyously ate all the meat that was scattered around the trap, but the moss and the trap were left untouched. And then followed a major operation in bear trapping. A mile away there was a steep slope of smooth rock, bounded at its foot by a creek. On one side was a huge tangle of down timber, on the other side loomed some impassable rocks; and a tiny meadow sloped away at the top. The half-fleshed carcasses of two dead elk were thrown half way down the rock slide, to serve as a bait. On the two sides two bear guns were set, and to their triggers were attached two long silk fish-lines, stretched taut and held parallel to each other, extending across the rocky slope. The idea was that the bear could not by any possibility reach the bait from above or below, without setting off at least one gun, and getting a bullet through his shoulders.

On the first night, no guns went off. The next morning it was found that the bear had crossed the stream and climbed straight up toward the bait until he reached the first fish-line; where he stopped. Without pressing the string sufficiently to set off its gun, he followed it to the barrier of trees. Being balked there, he turned about, retraced his steps carefully and followed the string to the barrier of rocks. Being blocked there, he back-tracked down the slide and across the stream, over the way he came. Then he widely circled the whole theatre, and came down toward the bait from the little meadow at its top of the slide.

Presently he reached the upper fish-line, twelve feet away from the first one. First he followed this out to the log barrier, then back to the rock ledge that was supposed to be unclimbable. There he scrambled up the "impossible" rocks, negotiated the ledge foot by foot, and successfully got around the end of line No. 2. Getting between the two lines he sailed out across the slope to the elk carcasses, feasted sumptuously, and then meandered out the way he came, without having disturbed a soul.

All this was done at night, and in darkness; and presumably that bear is there to this day, alive and well. No wonder Mr. Wright has a high opinion of the grizzly bear as a thinking animal.

In hiding their homes and young, either in burrows or in nests on the ground, wild rabbits and hares are wonderfully skilful, even under new conditions. Being quite unable to fight, or even to dig deeply, they are wholly dependent upon their wits in keeping their young alive by hiding them. Thanks to their keenness in concealment, the gray rabbit is plentiful throughout the eastern United States in spite of its millions of enemies. Is it not wonderful? The number killed by hunters last year in Pennsylvania was about 3,500,000!

The most amazing risk that I ever saw taken by a rabbit was made by a gray rabbit that nested in a shallow hole in the middle of a lawn-mower lawn east of the old National Museum building in Washington. The hollow was like that of a small wash-basin, and when at rest in it with her young ones the neutral gray back of the mother came just level with the top of the ground. At the last, when her young were almost large enough to get out and go

under their own steam, a lawn-mower artist chanced to look down at the wrong moment and saw the family. Evidently that mother believed that the boldest ventures are those most likely to win.

Among the hoofed and horned animals of North America the white-tailed deer is the shrewdest in the recognition of its enemies, the wisest in the choice of cover, and in measures for self-preservation. It seems at first glance that the buck is more keen-witted than the doe; but this is a debatable question. Throughout the year the buck thinks only of himself. During fully one-half the year the doe is burdened by the cares of motherhood, and the paramount duty of saving her fawns from their numerous enemies. This, I am quite sure, is the handicap which makes it so much easier to kill a doe in the autumn hunting season than to bag a fully antlered and sophisticated buck who has only himself to consider.

The white-tailed deer saves its life by skulking low in timber and thick brush. This is why it so successfully resists the extermination that has almost swept the mule deer, antelope, white goat, moose and elk from all the hunting-grounds of the United States. Thanks to its alertness in seeing its enemies first, its skill and quickness in hiding, _and its mental keenness in recognizing and using deer sanctuaries,_ the white-tailed or "Virginia" deer will outlive all the other hoofed animals of North America. In Pennsylvania they know enough to rush for the wire-bounded protected area whenever the hunters appear. That state has twenty-six such deer sanctuaries,--well filled with deer.

The moose and caribou dwell upon open or half-open ground, and are at the mercy of the merciless long-range rifles. Their keenness does not count much against rifles that can shoot and kill at a quarter of a mile. In the rutting season the bull moose of Maine or New Brunswick is easily deceived by the "call" of a birch-bark megaphone in the hands of a moose hunter who imitates the love call of the cow moose so skilfully that neither moose nor man can detect the falsity of the lure.

The mountain sheep is wide-eyed, alert and ready to run, but he dwells in exposed places from the high foothills up to the mountain summits, and now even the most bungling hunter can find him and kill him at long range. In the days of black powder and short ranges the sheep had a chance to escape; but now he has none whatever. He has keener vision and more alertness than the goat, but as a real life-saving factor that amounts to nothing! Wild sheep are easily and quickly exterminated.

The mountain goat has no protection except elevation and precipitous rocks, and to the hunter who has the energy to climb up to him he, too, is easy prey. Usually his biped enemy finds him and attacks him in precipitous mountains, where running and hiding are utterly impossible. When discovered on a ledge two feet wide leading across the face of a precipice, poor Billy has nothing to do but to take the bullets as they come until he reels and falls far down to the cruel slide-rock. He has a wonderful mind, but its qualities and its usefulness belong in Chapter XIII.

Warm-Coated Animals Avoid "Fresh Air." On this subject there is a

strange divergence of reasoning power between the wild animals of cold countries and the sleeping-porch advocates of today.

Even the most warm-coated of the fur-bearing animals, such as the bears, foxes, beavers, martens and mink, and also the burrowing rodents, take great pains to den up in winter just as far from the "fresh air" of the cold outdoors as they can attain by deep denning or burrowing. The prairie-dog not only ensconces himself in a cul-de-sac at the end of a hole fourteen feet deep and long, but as winter sets in he also tightly plugs up the mouth of his den with moist earth. When sealed up in his winter den the black bear of the north draws his supply of fresh air through a hole about one inch in diameter, or less.

But the human devotees of fresh air reason in the opposite direction. It is now the regular thing for mothers to open wide to the freezing air of out-doors either one or all the windows of the rooms in which their children sleep, giving to each child enough fresh air to supply ten full-grown elephants, or twenty head of horses. And the final word is the "sleeping-porch!" It matters not how deadly damp is the air along with its 33 degrees of cold, or the velocity of the wind, the fresh air must be delivered. The example of the fat and heavily furred wild beast is ignored; and I just wonder how many people in the United States, old and young, have been killed, or permanently injured, by fresh air, during the last fifteen years.

And furthermore. Excepting the hoofed species, it is the universal rule of the wild animals of the cold-winter zones of the earth that the mother shall keep her helpless young close beside her in the home nest and keep them warm partly by the warmth of her own body. The wild fur-clad mother does not maroon her helpless offspring in an isolated cot in a room apart, upon a thin mattress and in an atmosphere so cold that it is utterly impossible for the poor little body and limbs to warm it and keep it warm. Yet many human mothers do just that, and some take good care to provide a warmer atmosphere for themselves than they joyously force upon their helpless infants.

No dangerous fads should be forced upon defenseless children or animals.

A proper amount of fresh air is very desirable, but the intake of a child is much less than that of an elephant. Besides, if Nature had intended that men should sleep outdoors in winter, with the moose and caribou, we would have been furnished with ruminant pelage and fat.

VII

KEEN BIRDS AND DULL MEN

If all men could know how greatly the human species varies from highest to lowest, and how the minds and emotions of the lowest men parallel and dove-tail with those of the highest quadrupeds

and birds, we might be less obsessed with our own human ego, and more appreciative of the intelligence of animals.

A thousand times in my life my blood has been brought to the boiling point by seeing or reading of the cruel practices of ignorant and vicious men toward animals whom they despised because of their alleged standing "below man." By his vicious and cruel nature, many a man is totally unfitted to own, or even to associate with, dogs, horses and monkeys. Many persons are born into the belief that every man is necessarily a "lord of creation," and that all animals per se are man's lawful prey. In the vicious mind that impression increases with age. Minds of the better classes can readily learn by precept or by reasoning from cause to effect the duty of man to observe and defend the God-given rights of animals.

It was very recently that I saw on the street a group that represented man's attitude toward wild animals. It consisted of an unclean and vicious-looking man in tramp's clothing, grinding an offensive hand-organ and domineering over a poor little terrorized "ringtail" monkey. The wretched mite from the jungle was encased in a heavy woolen straight-jacket, and there was a strap around its loins to which a stout cord was attached, running to the Root of All Evil. The pavement was hot, but there with its bare and tender feet on the hot concrete, the sad-eyed little waif painfully moved about, peering far up into the faces of passers-by for sympathy, but all the time furtively and shrinkingly watching its tormentor. Every now and then the hairy old tramp would jerk the monkey's cord, each time giving the frail creature a violent bodily wrench from head to foot. I think that string was jerked about forty times every hour.

And that exhibition of monkey torture in a monkey hell continues in summer throughout many states of our country,--because "it pleases the children!" The use of monkeys with hand-organs is a cruel outrage upon the monkey tribe, and no civilized state or municipality should tolerate it. I call upon all humane persons to put an end to it.

As an antidote to our vaulting human egotism, we should think often upon the closeness of mental contact between the highest animals and the lowest men. In drawing a parallel between those two groups, there are no single factors more valuable than the home, and the family food supply. These hark back to the most primitive instincts of the vertebrates. They are the bedrock foundations upon which every species rests. As they are stable or unstable, good or bad, so lives or dies the individual, and the species also.

In employing the term "highest animals" I wish to be understood as referring to the warm-blooded vertebrates, and not merely the apes and monkeys that both structurally and mentally are nearest to man.

Throughout my lifetime I have been by turns amazed, entertained and instructed by the marvelous intelligence and mechanical skill of small mammals in constructing burrows, and of certain birds in the construction of their nests. Today the hanging nest of the Baltimore oriole is to me an even greater wonder than it was when

I first saw one over sixty years ago. Even today the mechanical skill involved in its construction is beyond my comprehension. My dull brain can not figure out the processes by which the bird begins to weave its hanging purse at the tip end of the most unstable of all earthly building sites,--a down-hanging elm-tree branch that is swayed to and fro by every passing breeze. The situation is so "impossible" that thus far no moving picture artist has ever caught and recorded the process.

Take in your hand a standard oriole nest, and examine it thoroughly. First you will note that it is very strong, and thoroughly durable. It can stand the lashings of the fiercest gales that visit our storm-beaten shore.

How long would it take a man to unravel that nest, wisp by wisp, and resolve it into a loose pile of materials? Certainly not less than an entire day. Do you think that even your skilful fingers,--unassisted by needles,--could in two days, or in three, weave of those same materials a nest like that, that would function as did the original? I doubt it. The materials consist of long strips of the thin inner bark of trees, short strings, and tiny grass stems that are long, pliable and tough. Who taught the oriole how to find and to weave those rare and hard-to-find materials? And how did it manage all that weaving with its beak only? Let the wise ones answer, if they can; for I confess that I can not!

Down in Venezuela, in the delta of the Orinoco River, and elsewhere, lives a black and yellow bird called the giant cacique (pronounced cay-seek'), which as a nest-builder far surpasses our oriole. Often the cacique's hanging nest is from four to six feet long. The oriole builds to escape the red squirrels, but the cacique has to reckon with the prehensile-tailed monkeys.

Sometimes a dozen caciques will hang their nests in close proximity to a wasps' nest, as if for additional protection. A cacique's nest hangs like a grass rope, with a commodious purse at its lower end, entered by a narrow perpendicular slit a foot or so above the terminal facilities. It is impossible to achieve one of these nests without either shooting off the limb to which it hangs, or felling the tree. If it hangs low enough a charge of coarse shot usually will cut the limb, but if high, cutting it down with a rifle bullet is a more serious matter.

[Illustration with caption: HANGING NEST OF THE BALTIMORE ORIOLE (From the "American Natural History")]

[Illustration with caption: GREAT HANGING NESTS OF THE CRESTED CACIQUE As seen in the delta of the Orinoco River, Venezuela.]

To our Zoological Park visitors the African weaver birds are a wonder and a delight. Orioles and caciques do not build nests in captivity, but the weavers blithely transfer their activities to their spacious cage in our tropical-bird house. The bird-men keep them supplied with raffia grass, and they do the rest. Fortunately for us, they weave nests for fun, and work at it all the year round! Millions of visitors have watched them doing it. To facilitate their work the upper half of their cage is judiciously supplied with tree-branches of the proper size and architectural slant. The weaving covers many horizontal branches. Sometimes a

group of nests will be tied together in a structure four feet long; and it branches up, or down, or across, seemingly without rhyme or reason.

Some of the weavers, which inhabit Africa, Malaya and Australia, are "communal" nest-builders. They build colonies of nests, close together. Imagine twenty-five or more Baltimore orioles massing their nests together on one side of a single tree, in a genuine village. That is the habit of some of the weaver birds;--and this brings us to what is called the most wonderful of all manifestations of house-building intelligence among birds. It is the community house of the little sociable weaver-bird of South Africa (*Philetoerus socius*). Having missed seeing the work of this species save in museums, I will quote from the Royal Natural History, written by the late Dr. Richard Lydekker, an excellent description: --This species congregates in large flocks, many pairs incubating their eggs under the same roof, which is composed of cartloads of grass piled on a branch of some camel-thorn tree in one enormous mass of an irregular umbrella shape, looking like a miniature haystack and almost solid, but with the under surface (which is nearly flat) honeycombed all over with little cavities, which serve not only as places for incubation, but also as a refuge against rain and wind.

"They are constantly being repaired by their active little inhabitants. It is curious that even the initiated eye is constantly being deceived by these dome-topped structures, since at a distance they closely resemble native huts. The nesting-chambers themselves are warmly lined with feathers."

Here must we abruptly end our exhibits of the intelligence of a few humble little birds as fairly representative of the wonderful mental ability and mechanical skill so common in the ranks of the birds of the world. It would be quite easy to write a volume on The Architectural Skill of Birds!

Now, let us look for a moment into the house-building intelligence and skill of some of the lower tribes of men. Out of the multitude of exhibits available I will limit myself to three, widely separated. In the first place, the habitations of the savage and barbaric tribes are usually the direct result of their own mental and moral deficiencies. The Eskimo is an exception, because his home and its location are dictated by the hard and fierce circumstances which dictate to him what he must do. Often he is compelled to move as his food supply moves. The Cliff-Dweller Indian of the arid regions of the Southwest was forced to cliff-dwell, in order to stave off extermination by his enemies. Under that spur he became a wonderful architect and engineer.

For present purposes we are concerned with three savage tribes which might have been rich and prosperous agriculturists or herdsmen had they developed sufficient intelligence to see the wisdom of regular industry.

Consider first the lowest of three primitive tribes that inhabit the extreme southern point of Patagonia, whose real estate holdings front on the Strait of Magellan. That region is treeless, rocky, windswept, cold and inhospitable. I can not imagine a place better fitted for an anarchist penal colony. North of it lie

plains less rigorous, and by degrees less sterile, and finally there are lands quite habitable by cattle-and-crop-growing men.

But those three tribes elect to stick to the worst spot in South America. The most primitive is the tribe of "canoe Indians" of Tierra del Fuego, which probably represents the lowest rung of the human ladder. Beside them the cave men of 30,000 years ago were kings and princes. Their only rivals seem to be the Poonans of Central Borneo, who, living in a hot country, make no houses or shelters of any kind, and have no clothing but a long strip of bark cloth around the loins.

The Fuegians have long been known to mariners and travellers. They inhabit a region that half the year is bleak, cold and raw, but they make nothing save the rudest of the rude in canoes--of rough slabs tied together and caulked _with moss,_--and rough bone-pointed spears, bows, arrows and paddles. Their only clothing consists of skins of the guanacos loosely hung from the neck, and flapping over the naked and repulsive body. They make no houses, and on shore their only shelters from the wind and snow and chilling rains are rabbit-like forms of brush, broken off by hand.

These people are lower in the scale of intelligence than any wild animal species known to me; for they are mentally too dull and low to maintain themselves on a continuing basis. Their hundred years of contact with man has taught them little; and numerically they are decreasing so rapidly that the world will soon see the absolute finish of the tribe.

In the best of the three tribes, the Tchuelclus, the birth rate is so low that within recent times the tribe has diminished from about 5,000 to a remnant of about 500.

Now, have those primitive creatures "immortal souls?" Are they entitled to call chimpanzees, elephants, bears and dogs "lower animals?" Do they "think," or "reason," any more than the animals I have named?

It is a far cry from the highest to the lowest of the human race; and we hold that the highest animals intellectually are higher than the lowest men.

Now go with me for a moment to the lofty and dense tropical forest in the heart of the Territory of Selangor, in the Malay Peninsula. That forest is the home of the wild elephant, rhinoceros and sladang. And there dwells a jungle tribe called the Jackoons, some members of which I met at their family home, and observed literally in their own ancestral tree. Their house was not wholly bad, but it might have been 100 per cent better. It was merely a platform of small poles, placed like a glorified bird's nest in the spreading forks of a many-branched tree, about twenty feet from the ground. The main supports were bark-lashed to the large branches of the family tree. Over this there was a rude roof of long grass, which had a fairly intelligent slope. As a shelter from rain, the Jackoon house left much to be desired. The scanty loin cloths of the habitants knew no such thing as wash-day or line. With all its drawbacks, however, this habitation was far more adequate to the needs of its builders than the cold brush rabbit-forms of the Patagonian canoe Indians.

We now come to a tribe which has reduced the problem of housing and home life to its lowest common denominator. The Poonans of Central Borneo, discovered and described by Carl Bock, build _no houses of any kind, _ not even huts of green branches; and their only overture toward the promotion of personal comfort in the home is a five-foot grass mat spread upon the sodden earth, to lie upon when at rest. And this, in a country where in the so-called "dry season" it rains half the time, and in the "wet season" all the time.

The Poonans have rudely-made spears for taking the wild pig, deer and smaller game, their clothes consist of bark cloth, around the loins only. They know no such thing as agriculture, and they live off the jungle.

It was said some years ago that a similarly primitive jungle tribe of Ceylon, known as the Veddahs, could count no more than five, that they could not comprehend "day after to-morrow," and that their vocabulary was limited to about 200 words.

It is very probable that the language of the Poonans and the Jackoons is equally limited. And what are we to conclude from all the foregoing? Briefly, I should say that the architectural skill of the orioles, the caciques and the weaver birds is greater than that of the South Patagonia native, the Jackoon and the Poonan. I should say that those bird homes yield to their makers more comfort and protection, and a better birth-rate, than are yielded by the homes of those ignorant, unambitious and retrogressive tribes of men now living and thinking, and supposed to be possessed of reasoning powers. If the whole truth could be known, I believe it would be found that the stock of ideas possessed and used by the groups of highly-endowed birds would fully equal the ideas of such tribes of simple-minded men as those mentioned. If caught young, those savages could be trained by civilized men, and taught to perform many tricks, but so can chimpanzees and elephants.

Curiously enough, it is a common thing for even the higher types of civilized men to make in home-building just as serious mistakes as are made by wild animals and savages. For example, among the men of our time it is a common mistake to build in the wrong place, to build entirely too large or too ugly, and to build a Colossal Burden instead of a real Home. From many a palace there stands forth the perpetual question: "_Why_ did he do it?"

Any reader who at any time inclines toward an opinion that the author is unduly severe on the mentality of the human race, even as it exists today in the United States, is urged to read in the _Scientific Monthly_ for January, 1922, an article by Professor L. M. Tennen entitled "Adventures in Stupidity.--A Partial Analysis of the Intellectual Inferiority of a College Student." He should particularly note the percentages on page 34 in the second paragraph under the subtitle "The Psychology of Stupidity."

VIII

THE MENTAL STATUS OF THE ORANG-UTAN

My first ownership of a live orang-utan began in 1878, in the middle of the Simujan River, Borneo, where for four Spanish dollars I became the proud possessor of a three-year old male. No sooner was the struggling animal deposited in the bottom of my own boat than it savagely seized the calf of my devoted leg and endeavored to bite therefrom a generous cross section. My leggings and my leech stockings saved my life. That implacable little beast never gave up; and two days later it died,--apparently to spite me.

My next orang was a complete reverse of No. 1. He liked not the Dyaks who brought him to me, but in the first moment of our acquaintance he adopted me as his foster-father, and loved me like a son. Throughout four months of jungle vicissitudes he stuck to me. He was a high-class orang,--and be it known that many orangs are thin-headed scrubs, who never amount to anything. His skull was wide, his face was broad, and he had a dome of thought like a statesman. He had a fine mind, and I am sure I could have taught him everything that any ape could learn.

During the four months that he lived with me I taught him, almost without effort, many things that were necessary in our daily life. Even the Dyaks recognized the fact that the "Old Man" was an orang (or "mias") of superior mind, and some of them traveled far to see him. Unfortunately the exigencies of travel and work compelled me to present him to an admiring friend in India. Mr. Andrew Carnegie and his then partner, Mr. J. W. Vandevorst, convoyed my Old Man and another small orang from Singapore to Colombo, Ceylon, whence they were shipped on to Madras, received there by my old friend A. G. R. Theobald,--and presented at the court of the Duke of Buckingham.

Up to a comparatively recent date, the studies of the psychologists that have been devoted to the minds of animals below man, have been chiefly concerned with low and common types. Comparatively few investigators have found it possible to make extensive and prolonged observations of the most intelligent wild animals of the world, even in zoological gardens, and their observations on wild animals in a state of nature seem to have been even more circumscribed. I know only three who have studied any of the great apes.

In attempting to fathom the mental capacity and the mental processes of some of the highest mammals, there is the same superior degree of interest attaching to the study of wild species that the ethnologist finds in the study of savage races of men that have been unspoiled by civilization. Obviously, it is more interesting to fathom the mind of a creature in an absolute state of nature than of one whose ancestors have been bred and reared in the trammels of domestication and for many successive generations have bowed to the will of man. The natural fury of the Atlantic walrus, when attacked, is much more interesting as a psychologic study than is the inbred rage of the bull-dog; and the remarkable

defensive tactics of the musk-ox far surpass in interest the vagaries of range cattle.

For several reasons, the great apes, and particularly the chimpanzees and orang-utans, are the most interesting subjects for psychologic study of all the wild-animal species with which the writer is acquainted. Primarily this is due to the fact that intellectually and temperamentally, as well as anatomically, these animals stand very near to man himself, and closely resemble him. The great apes mentioned can give visible expression to a wide range of thoughts and emotions,

The voice of the adult orang-utan is almost absent, and only sufficient to display on rare occasions. What little there is of it, in animals over six years of age, is very deep and guttural, and may best be described as a deep-bass roar. Under excitement the orang can produce a roar by inhalation. Young orangs under two years of age often whine, or shriek or scream with anger, like excited human children, but with their larger growth that vocal power seems to leave them.

Despite the difference in temperament and quickness in delivery, I regard the measure of the orang-utan's mental capacity as being equal to that of the chimpanzee; but the latter is, and always will remain, the more alert and showy animal. The superior feet of the chimpanzee in bipedal work is for that species a great advantage, and the longer toes of the orang are a handicap. Although the orang's sanguine temperament is far more comforting to a trainer than the harum-scarum nervous vivacity of the chimpanzee, the value of the former is overbalanced, on the stage, by the superior acting of the chimp. For these reasons the trainers generally choose the chimp for stage education.

The chimpanzee is not only nervous and quick in thought and in action, but it is equally so _in temper._ It will play with any good friend to almost any extent, but the moment it suspects malicious unfairness, or what it regards as a "mean trick," it instantly becomes angry and resentful. Once when I attempted to take from our large black-faced chimpanzee, called Soko, a small lump of rubber which I feared she might swallow, my efforts were kindly but firmly thwarted. At last, when I diverted her by small offerings of chocolate, and at the right moment sought by a strategic movement to snatch the rubber from her, the palpable unfairness of the attempt caused the animal instantly to fly into a towering passion, and seek to wreak vengeance upon me. Her lips drew far back in a savage snarl, and she denounced my perfidy by piercing cries of rage and indignation. She also did her utmost to seize and drag me forcibly within reach of her teeth, for the punishment which she felt that I deserved.

A large male orang-utan named Dohong, under a similar test, revealed a very different mental attitude. He dexterously snatched a valuable watch-charm from a visitor who stood inside the railing of his cage, and fled with it to the top of his balcony. As quickly as possible I thrust my handkerchief between the bars, and waved it vigorously, to attract him. At once the animal came down to me, to secure another trophy, and before he realized his position I successfully snatched the charm from him, and restored it unharmed to its owner. Dohong seemed to regard the episode as a

good joke. Without manifesting any resentment he turned a somersault on his straw, then climbed upon his trapeze and began to perform, as if nothing in particular had occurred.

The orang is distinctly an animal of more serene temper and more philosophic mind than the chimpanzee. This has led some authors erroneously to pronounce the orang an animal of morose and sluggish disposition, and mentally inferior to the chimpanzee. After a close personal acquaintance with about forty captive orangs of various sizes, I am convinced that the facts do not warrant that conclusion. The orang-utans of the New York Zoological Park certainly have been as cheerful in disposition, as fond of exercise and as fertile in droll performances as our chimpanzees. Even though the mind of the chimpanzee does act more quickly than that of its rival, and even though its movements are usually more rapid and more precise, the mind of the orang carries that animal precisely as far. Moreover, in its native jungles the orang habitually builds for itself a very comfortable nest on which to rest and sleep, which the chimpanzee ordinarily does not do.

I think that the exact mental status of an anthropoid ape is best revealed by an attempt to train it to do some particular thing, in a manner that the trainer elects. Usually about five lessons, carefully observed, will afford a good index of the pupil's mental capabilities. Some chimpanzees are too nervous to be taught, some are too obstinate, and others are too impatient of restraint. Some orang-utans are hopelessly indifferent to the business in hand, and refuse to become interested in it. I think that no orang is too dull to learn to sit at a table, and eat with the utensils that are usually considered sacred to man's use, but the majority of them care only for the food, and take no interest in the function. On the other hand, the average chimpanzee is as restless as a newly-caught eel, and its mind is dominated by a desire to climb far beyond the reach of restraining hands, and to do almost anything save that which is particularly desired.

Among the twenty or more orangs which up to 1922 have been exhibited in the Zoological Park, two stand out with special prominence, by reason of their unusual mental qualities. They differed widely from each other. One was a born actor and imitator, who loved human partnership in his daily affairs. The other was an original thinker and reasoner, with a genius for invention, and at all times impatient of training and restraint. The first was named Rajah, the latter was called Dohong.

Rajah was a male orang, and about four years of age when received by us. His high and broad forehead, large eyes and general breadth of cranium and jaw marked him at once as belonging to the higher caste of orangs. Dealers and experts have no difficulty in recognizing at one glance an orang that has a good brain and good general physique from those which are thin-headed, narrow-jawed, weak in body and unlikely to live long.

At the Zoological Park we have tested out the orang-utan's susceptibility to training, and proven that the task is so simple and easy that even amateurs can accomplish much in a short time. Desiring that several of our orangs should perform in public, we instructed the primate keepers to proceed along certain lines and

educate them to that idea. Naturally, the performance was laid out to match our own possibilities. In a public park, where only a very little time can be devoted to training, we do not linger long over an animal that is either stupid or obstinate. Those which cannot be trained easily and quickly are promptly set aside as ineligible.

Without any great amount of labor, and with no real difficulty, our oranges were trained to perform the following simple acts:

1. To sit at table, and eat and drink like humans. This involved eating sliced bananas with a fork, pouring out milk from a teapot into a teacup, drinking out of a teacup, drinking out of a beer-bottle, using a toothpick, striking a match, lighting a cigarette, smoking and spitting like a man.
2. To ride a tricycle, or bicycle.
3. To put on a pair of trousers, adjust the suspenders, put on a sweater or coat, and a cap, reversing the whole operation after the performance.
4. To drive nails with a hammer.
5. Use a key to lock and unlock a padlock. The animal most proficient in this became able to select the right Yale key out of a bunch of half a dozen or more, with as much quickness and precision as the average man displays.

The orang Dohong learned to pedal and to guide a tricycle in about three lessons. He caught the two ideas almost instantly, and soon brought his muscles under control sufficiently to ride successfully, even under difficult conditions.

It was quickly recognized that our Rajah was a particularly good subject, and with him the keepers went farther than with the four others. From the first moment, the training operations were to him both interesting and agreeable. The animal enjoyed the work, and he entered into it so heartily that in two weeks he was ready to dine in public, somewhat after the manner of human beings.

A platform eight feet in height was erected in front of the Reptile House, and upon it were placed a table, a high chair such as small children use, and various dishes. To the platform a step-ladder led upward from the ground. Every day at four o'clock lusty Rajah was carried to the exhibition space, and set free upon the ground. Forthwith the keepers proceeded to dress him in trousers, vest, coat and cap. The moment the last button had been fastened and the cap placed upon his head, he would promptly walk to the ladder, climb up to the platform, and in the most business-like way imaginable, seat himself in his chair at the table, all ready to dine.

He used a napkin, ate his soup with a spoon, speared and conveyed his sliced bananas with his fork, poured milk from a teapot into his teacup, and drank from his cup with great enjoyment and decorum. When he took a drink (of tea) from a suspicious-looking black bottle, the audience always laughed. When he elevated the empty bottle to one eye and looked far into it, they roared; and

when he finally took a toothpick and gravely placed it in his mouth, his auditors were delighted. Several times during the progress of each meal, Rajah would pause and benignly gaze down upon the crowd, like a self-satisfied judge on his bench.

Not once did Rajah spoil this exhibition, which was continued throughout an entire summer, nor commit any overt act of impatience, indifference or meanness. The flighty, nervous temper of the chimpanzee was delightfully absent. The most remarkable feature of it all was his very evident enjoyment of his part of the performance, and his sense of responsibility to us and to his audiences.

Rajah easily and quickly learned to ride a tricycle, and guide it himself. But for his untimely death, through a remarkable invasion of a microscopic parasite (*Balantidium coli*) imported from the Galapagos Islands by elephant tortoises, his mind would have been developed much farther. Since his death, in 1902, we have had other orang-utans that were successfully taught to dine, but none of them entered into the business with the same hearty zest which characterized Rajah, and made his performances so interesting.

We now come to a consideration of simian mental traits of very different character. Another male orang, named Dohong, of the same age and intellectual caste as Rajah, developed a faculty for mechanics and invention which not only challenged our admiration, but also created much work for our carpenters. He discovered, or invented, as you please, the lever as a mechanical force,--as fairly and squarely as Archimedes discovered the principle of the screw. Moreover, he delighted in the use of the new power thus acquired, quite as much as the successful inventor usually does. At the same time, two very bright chimpanzees of his own age, and with the same opportunities, discovered nothing.

[Illustration caption: THUMB-PRINT OF AN ORANG-UTAN
A group of fourteen experts in the New York City Departement of Criminal Records were unable to recognise this thumb print as anything else than that of a man]

[Illustration caption: "RAJAH," THE ACTOR ORANG-UTAN
In three lessons he learned to ride a tricycle]

Dohong was of a reflective turn of mind, and never was entirely willing to learn the things that his keepers sought to teach him. To him, dining at a table was tiresomely dull, and the donning of fashionable clothing was a frivolous pastime. On the other hand, the interior of his cage, and his gymnastic appliances of ropes, trapeze and horizontal bars, all interested him greatly. Every square inch of surface, and every piece of material in his apartment, was carefully investigated, many times over.

When three years old he discovered his own strength, and at first he used it good-naturedly to hector his cage-mate, a female chimpanzee smaller than himself. That, however, was of trifling interest. The day on which he made the discovery that he could break the wooden one and one-half inch horizontal bars that were held out from his cage walls on cast iron brackets, was for him a great day. Before his discovery was noted by the keepers he had joyfully destroyed two bars, and with a broken piece used as a

lever was attacking a third. These bars were promptly replaced by larger bars, of harder wood, but screwed to the same cast-iron brackets that had carried the first series.

For a time, the heavier bars endured; but in an evil moment the ape swung his trapeze bar, of two-inch oak, far over to one side of his cage, and applied the bar as a lever, inside of a horizontal bar and from above. The new force was too much for the cast-iron brackets, and one by one they gave way. Some were broken off, and others were torn from the wall by the breaking of the screws that held them. Knowing that all those brackets must be changed immediately, Dohong was left to destroy them; which he did, promptly and joyfully. We then made heavy brackets of flat wrought iron bars, 1/2 by 2 1/2 inches, unbreakable even with a lever. These were screwed on with screws so large and heavy that our carpenters knew they were quite secure.

[Illustration caption: THE LEVER THAT OUR ORANG-UTAN INVENTED, AND THE WAY HE APPLIED IT By W. A. Camadeo, in the "Scientific American," 1907]

In due time, Dohong tested his lever upon the bars with their new brackets, and at first they held securely. Then he engaged Polly, his chimpanzee companion, to assist him to the limit of her strength. While Dohong pulled on the lever, Polly braced her absurd little back against the wall, and pushed upon it, with all her strength. At first nothing gave way. The combined strength exerted by the three brackets was not to be overcome by prying at the horizontal bar itself. It was then that Dohong's inventive genius rose to its climax. He decided to attack the brackets singly, and conquer them one by one. On examining the situation very critically, he found that each bracket consisted of a right-angled triangle of wrought iron, with its perpendicular side against the wall, its base uppermost, and its hypotenuse out in the air. Through the open centre of the triangle he introduced the end of his trapeze bar, chain and all, as far as it would go, then gave a mighty heave. The end of his lever was against the wall, and the power was applied in such a manner that few machine screws could stand so great a strain. One by one, the screws were torn out of the wood, and finally each bracket worked upon was torn off.

But there was one exception. The screws of one bracket were so firmly set in a particularly hard strip of the upright tongued-and-grooved yellow pine flooring that formed the wall, the board itself was finally torn out, full length! The board was four inches wide, seven-eighths of an inch thick, and seven feet long. Originally it was so firmly nailed that no one believed that it could be torn from its place. [Footnote: In the Winter of 1921 about a dozen newspapers in the United States published a sensational syndicated article, occupying an entire page, in which all of Dohong's lever discovery and cage-wrecking performances were reported as of recent occurrence, and credited to a stupid and uninteresting young orang called Gabong, now in the Zoological Park, that has not even the merit of sufficient intelligence to maintain a proper state of bodily uprightness, let alone the invention of mechanical principles.]

Without delay, Dohong started in with his lever to pry off the remaining boards of the wall, but this movement was promptly checked. Our next task consisted in making long bolts by which the brackets of the horizontal bars were bolted entirely through the partition walls and held so powerfully on the other side that even the lever could not wreck them.

As soon as the brackets were made secure, Dohong turned his attention to the two large sleeping boxes which were built very solidly on the balcony of his cage. Both of those structures he tore completely to pieces,--always working with the utmost good nature and cheerfulness. Realizing that they could not exist in the cage with him, we gave him a permit to tear them out--and save the time of the carpenters.

Dohong's use of his lever was seen by hundreds of visitors, and one frequent visitor to the Park, Mr. L. A. Camacho, an engineer, was so much impressed that he published in the Scientific American an illustrated account of what he saw.

For a long period, Dohong had been more or less annoyed by the fact that he could not get his head out between the front bars of his cage, and look around the partition into the home of his next-door neighbor. Very soon after he discovered the use of the lever, he swung his trapeze bar out to the upper corner of his cage, thrust the end of it out between the first bar and the steel column of the partition, and very deftly bent two of the iron bars outward far enough so that he could easily thrust his head outside and have his coveted look.

One of our later and largest oranges made a specialty of twisting the straw of his bedding into a rope six or seven feet long, then throwing it over his trapeze bar and swinging by it, forward and back.

Time and space will not permit the enumeration of the various things done by that ape of mechanical mind with his swinging rope and his trapeze, with ropes of straw twisted by himself, with keys, locks, hammer, nails and boxes. Any man who can witness such manifestations as those described above, and deny the existence in the animal of an ability to reason from cause to effect, must be prepared to deny the evidence of his own senses.

The individual variations between oranges, as also between chimpanzees, are great and striking. It may with truth be said that no two individuals of either species are really quite alike in physiognomy, temperament and mental capacity. As subjects for the experimental psychologist, it is difficult to see how any other could be found that would be even a good second in living interest to the great apes. The facts thus far recorded, so I believe, present only a suggestion of the rich results that await the patient scientific investigator. In the year 1915 Dr. Robert M. Yerkes, of Harvard University, conducted at Montecito, southern California, in a comfortable primate laboratory, six months of continuous and diligent experiments on the behavior of orang-utans and monkeys. His report, published under the title of "The Mental Life of Monkeys and Apes: A Study of Ideational Behavior," is a document of much interest and value. Dr. Yerkes' use of the orang-utan as a subject was a decided step forward in

the study of "animal behavior" in America.

IX

THE MAN-LIKENESS OF THE CHIMPANZEE

During the past twenty years, millions of thinking people have been startled, and not a few shocked, by the amazing and uncanny human-likeness of the performances of trained chimpanzees on the theatrical stage. Really, when a well trained "chimp" is dressed from head to foot like a man, and is seen going with quickness, precision and spirit through a performance half an hour in length, we go away from it with an uncomfortable feeling that speech is all that he lacks of being a citizen.

In 1904 the American public saw Esau. Next came Consul,--in about three or four separate editions! In 1909 we had Peter. Then came I know not how many more, including the giant Casey and Mr. Garner's Susie; and finally in 1918 our own Suzette. The theatre-going public has been well supplied with trained chimpanzees, and the mental capacity of that species is now more widely known and appreciated than that of any other wild animal except the Indian elephant.

There are several reasons why chimpanzees predominate on the stage, and why so few performing orang-utans have been seen. They are as follows:

1. The orang is sanguine, and slower in execution than the nervous chimpanzee.
2. The feet of the orang are not good for shoes, and biped work.
3. The orang is rather awkward with its hands, and finally,
4. There are fully twice as many chimps in the market.

But the chimpanzee has certain drawbacks of his own. His nervous temper and his forced-draught activities soon wear him out. If he survives to see his sixth or seventh year, it is then that he becomes so strong and so full of ego that he becomes dangerous and requires to be retired.

Bright minds are more common among the chimpanzee species than among the orangs. Three chimps out of every five are good for training, but not more than two orangs out of five can be satisfactorily developed.

Some sensitive minds shrink from the idea that man has "descended" from the apes. I never for a moment shared that feeling. I would rather descend from a clean, capable and bright-minded genus of apes than from any unclean, ignorant and repulsive race of the genus *Homo*. In comparing the chimpanzees of Fernan Vaz with the Canoe Indians of the Strait of Magellan and other human tribes we could name, I think the former have decidedly the best

of it. There are millions of members of the human race who are more loathsome and repulsive than wild apes.

The face of the chimpanzee is highly mobile, and the mouth, lips, eyes and voice express the various emotions of the individual with a degree of clearness and precision second only to the facial expression of man himself. In fact, the face of an intelligent chimpanzee or orang-utan is a fairly constant index of the state of mind of the individual. In their turn, those enormously expansive lips and keen brown eyes express contentment, doubt, fear and terror; affection, disapproval, jealousy, anger, rage; hunger and satiety; lonesomeness and illness.

The lips of the chimpanzee afford that animal several perfectly distinct expressions of the individual's mind and feelings. While it is not possible to offer a description of each which will certainly be recognizable to the reader, the two extremes will at least be appreciated. When coaxing for food, or attention, the lips are thrust far out beyond the teeth, and formed into a funnel with the small end outermost. When the chimpanzee flies into a rage at some real or fancied offense, the snarling lips are drawn back, and far up and down, until the teeth and gums are fully exposed in a ghastly threat of attack. At the same time, the voice gives forth shrill shrieks of rage, correctly represented by the syllable "Ee-ee-ee!", prolonged, and repeated with great force, three or four times. On such occasions as the latter, the offending party must look out for himself, or he may be roughly handled.

The voice of the chimpanzee is strong, clear, and in captivity it is very much in evidence. Two of its moderate tones are almost musical. It is heard when the animal says, coaxingly, "Who'-oe! Who'-oe!" A dozen times a day, our large specimens indulge in spells of loud yelling, purely for their own amusement. Their strident cry sounds like "Hoo-hoo-hoo-hoo! _Wah' _hoo! _Wah' _hoo! Hoo'-hoo! _Wah_-h-h-h! _Wah_-h-h!" The second combination, "Wah-hoo," consists of two sounds, four notes apart.

It is with their voices that chimpanzees first manifest their pleasure at seeing cherished friends of the human species, or their anger. Their recognition, and their exuberant joy on such occasions, is quite as apparent to every observer as are the manifestations of welcome of demonstrative human beings.

Like all other groups of species, the apes of various genera now living vary widely in their mentalities. The chimpanzee has the most alert and human-like mind but with less speed the orang-utan is a good second. The average captive gorilla, if judged by existing standards for ape mentality, is a poor third in the anthropoid scale, below the chimp and orang; but since the rise of Major Penny's family-pet gorilla, named John, we must revise all our former views of that species, and concede exceptions.

In studying the mental status of the primates I attach great importance to the work and results of the professional trainers who educate animals for stage performances. If the trainer does not know which are the brightest species of apes, baboons and monkeys, then who does? Their own fortunes depend upon their

estimate of comparative mentality in the primates. Fortunately for our purposes, the minds of the most intelligent and capable apes, baboons, and monkeys have been partially developed and exploited by stage trainers, and to a far less extent by keepers in zoological parks. Some wonderful results have been achieved, and the best of these have been seen by the public in theatres, in traveling shows and in zoological parks. All these performances have greatly interested me, because they go so far as measures of mental capacity. I wish to make it clear that I take them very seriously.

[Illustration

with caption: PORTRAIT OF A HIGH-CASTE CHIMPANZEE "Baldy" was an animal of fine intelligence and originality in thought. He was a natural comedian]

While many of the acts of trained animals are due to their power of mimicry and are produced by imitation rather than by original thought, even their imitative work reveals a breadth of intelligence, a range of memory and of activity and precision in thought and in energy which no logical mind can ignore. To say that a chimpanzee who can swing through thirty or forty different acts "does not think" and "does not reason," is to deny the evidence of the human senses, and fall outside the bounds of human reason.

Training Apes for Performances. As will appear in its own chapter, there is nothing at all mysterious in the training of apes. The subject must be young, and pliant in mind, and of cheerful and kind disposition. The poor subjects are left for cage life. The trainer must possess intelligence of good quality, infinite patience and tireless industry. Furthermore, the stage properties must be ample. An outfit of this kind can train any ape that is mentally and physically a good subject. Of course in every animal species, wild or domestic, there are individuals so dull and stupid that it is inexpedient to try to educate them.

The chimpanzee Suzette who came to us direct from the vaudeville stage performed every summer in her open-air "arena cage," until she entered motherhood, which put an end to her stage work. She was a brilliant "trick" bicycle rider. She could stand upright on a huge wooden ball, and by expert balancing and foot-work roll it up a steep incline, down a flight of stairs, and land it safely upon the stage, without once losing her balance or her control. She was entirely at home on roller skates, and when taken out upon the pavement of Baird Court she would go wildly careering around the large grass plat at high speed.

All the above acts were acrobatic feats that called for original thought and action, and were such as no dull mind and body could exert. All the training skill in the world could not take a machine and teach it to ride a bicycle through a collection of bottles, and an intelligent ape is a million years from being a "machine in fur and feathers."

More than once I have been astounded by the performances of apes on the stage. Mr. J. S. Edwards' orang-utan Joe was a very capable animal, and his performances were wonderful. He could use a hammer in driving nails, and a screwdriver in inserting and extracting screws, with wonderful dexterity.

The most remarkable chimpanzee performance that I ever saw was given in a New York theatre in 1909. The star actor was a fine male animal about six years old, called Peter. I made a complete record of his various acts, and the program was as follows

PERFORMANCE OF PETER, A CHIMPANZEE

Stage properties: a suit of clothes, shoes, chair, table, bed, bureau, hatrack, candle, cigarette, match, cuspidor, roller skates, bottles, flag, inclined plane and steps; plate, napkin, cup, spoon, teapot.

As Peter entered, he bowed to the audience, took off his cap and hung it upon a hatrack. He went to the table, seated himself in the chair, unfolded and put on a napkin, and with a string fastened it in place under his chin. With a fork he speared some slices of banana and ate them. Into his tumbler he poured liquid from a bottle, drank, then corked the bottle. Next, he poured tea into a cup, put in sugar and cream, took tea from the spoon, then drank from the cup. After that he took a toothpick and used it elaborately.

Striking a match he lit a cigarette, and smoked. In perfect man-fashion he took the cigarette between his fingers, gave his keeper a light, smoked again, and blew puffs of smoke first from one corner of his mouth and then the other. Then he elaborately spat into the cuspidor.

Next in order he went to the bureau, cleaned his teeth with a tooth-brush, brushed his hair on both sides, looked into the mirror and powdered his face.

Finally he bit a coin and put it on the keeper's plate as a tip.

He pulled off his coat, took off his cuffs and vest, and thus half undressed he joyously danced about, beating a tambourine. Then he removed his shirt, trousers, shoes, garters and socks. Lighting his candle he walked to his bed, blew out the candle and went to bed.

Very soon he rose, put on his trousers and a pair of roller skates and playfully pursued a young woman who ran before him. His use of the roller skates was excellent.

The stage was cleared of furniture, and a bicycle was brought out. He mounted it and started off, at the first trial, and swiftly rode around the stage about fifteen times. While riding he took off his cap and waved it. He rode up an inclined plane and down four steps without falling off, repeating for an encore,--but here he became peeved about something.

Five bottles were set in a figure 8, and he rode between them several times. At last he took up a bottle and drank out of it. Then he drank out of a tumbler, all while riding. After much flag-waving and swift riding, Peter stopped at the center of the stage, dismounted, bowed, clapped his hands vigorously and retired.

Peter's performance was remarkable because of the great length of

it, the absolute skill and precision of it, and the animal's easy mastery of every situation. There was a notable absence of hesitations and mistakes, and of visible direction. The trainer seemed to do nothing save to assist with the stage properties, just as an assistant helps any acrobat through the property business of his act. If any commands or signs were given, the audience was not aware of it. Later on I learned that sometimes Peter did not perform with such spirit, and required some urging to be prompt. The trainer was kept hustling to keep up with his own duties. The animal seemed to remember, and I believe he did remember, the sequence of a performance of _fifty-six separate acts!_

When I witnessed Peter's performance in New York, saw the length of it and noted the immense amount of nervous energy that each performance used up, I made the prediction that he could not for one year endure such a strain. It was reported to me that he died nine months from that time.

In October, 1909, when Peter went to Philadelphia, he was frequently and closely studied and observed by Dr. Lightner Witmer, professor of psychology at the University of Pennsylvania, and his mentality was tested at the laboratory of the University. Dr. Witmer's conclusions, as set forth in a paper in the December (1909) issue of the _Psychological Clinic,_ are of very great interest. He approached Peter's first performance in a skeptical frame of mind. I gladly waive the opportunity to express my own views regarding Peter in order to put upon the stand a more competent witness. Hear Dr. Witmer:

"As I entered the theatre," he says, "my feelings were commingled interest and doubt. My doubts were bred from knowledge of the difficulty of judging the intelligence of an animal from a stage performance. So-called educated horses and even educated seals and fleas have made their appeal in large number to the credulity of the public. Can any animal below man be educated in the proper sense of the word? Or is the animal mind susceptible of nothing more than a mechanical training, and only given the specious counterfeit of an educated intelligence when under the direct control of the trainer?

"Since that day I have seen Peter in five public performances, have tested him at my psychological clinic and privately on three occasions. I now believe that in a very real sense the animal is himself giving the stage performance. He knows what he is doing, he delights in it, he varies it from time to time, he understands the succession of tricks which are being called for, he is guided by word of mouth without any signal open or concealed, and the function of his trainer is exercised mainly to steady and control.

"I am prepared to accept the statement of his trainers, Mr. and Mrs. McArdle, that Peter's proficiency is not so much the result of training as of downright self-education."

Peter was put through many of the tests which Dr. Witmer uses for the study of backward children. He performed many of these tests in a very satisfactory manner. He was able to string beads the first time he tried it. He put pegs in the ordinary kindergarten pegging board. He opened and closed a very difficult lock. He used

hammer and screw driver, and distinguished without any mistake between nails and screws. A peculiar kind of hammer was given to him in order to fool him, but Peter was not fooled. He felt both ends of the hammer and used the flat end instead of the round end.

Showing his initiative during the tests, Peter got away from those who were watching him and darted for a washstand, quickly turned the faucet and put his mouth to the spigot and secured a drink before he was snatched away by his trainers. He understood language and followed instructions without signs. He was able to say "mamma," and Doctor Witmer taught him in five minutes to give the sound of "p." The most remarkable performance was making the letter "w" on the blackboard, in which he imitated Doctor Witmer's movements exactly, and reproduced a fair copy of the letter.

The last four paragraphs reproduced above have been copied from an article which appeared in the Philadelphia Public Ledger on December 17, 1909.

Dr. Witmer declares that the study of this ape's mind is a subject fit, not for the animal psychologist, but for the child psychologist.

Suzette's Failure in Maternal Instinct. As a closing contribution to our observations on the chimpanzee, I must record a tragic failure in maternal instinct, as well as in general intelligence, in a chimpanzee.

In 1919 our two fine eight-year old chimpanzees, Boma and Suzette, were happily married. It was a genuine love match, and strictly monogamous at that; for while big Fanny Chimp in the cage next door to Boma loved Boma and openly courted him, he was outrageously indifferent to her, and even scorned her. After seven months of gestation, a very good baby was born to Suzette, quite naturally and successfully. Boma's shouts of excitement and delight carried half a mile throughout the Park. Everything looked most auspicious for the rearing of a wonderful cage-bred and cage-born chimpanzee, the second one ever born in captivity. Instead of carrying her infant astride her hip, as do orang mothers, and the coolie women of India, Suzette astonished us beyond measure by tucking it into her groin, between her thigh and her abdomen, head outward. It was a fine place,--warm and soft,--but not good when overdone! When Suzette walked, as she freely did, she held up the leg responsible for the baby, to hold it securely in place, and walked upon the other foot and her two hands. About all this there was one very bad thing. The baby was perfectly helpless! As long as the mother chose to keep it in her groin prison, it could not get free.

Suzette was completely isolated, kept absolutely quiet, and every chance was given her to go on with the functions of motherhood. Her breasts contained plenty of milk, and the flow was due to start on the second day after the infant's arrival.

Day and night the baby was jealously confined in that massive and powerful groin,--and under too much pressure! When the baby cried, and kicked, and struggled to get free, Suzette would nervously rearrange her straw bed, carefully pick from the tiny fingers every straw that they had clutched, and settle down again.

If the struggle was soon renewed, Suzette would change the infant over to the other groin, and close upon it as before.

Sleeping or waking, walking, sitting or lying down, she held it there. If we attempted to touch the infant, the mother instantly became savage and dangerous. Not one human finger was permitted to touch it. For hours, and for days, we anxiously watched for nursing to begin; but in vain. At last we became almost frantic from the spectacle of the infant being slowly starved to death because the mother did not realize that it needed her milk, and that she alone could promote nursing. _Her mother instinct utterly failed to supply the link that alone could connect infancy to motherhood, and furnish life._

Of course this failure was due to poor Suzette's artificial life, and unnatural surroundings. Had she been all alone, in the depths of a tropical forest, Nature would have proceeded along her usual lines. But in our Primate House, Suzette felt that her infant was surrounded by a host of strange enemies, from whom it must be strongly and persistently _guarded and defended._ That was the idea that completely dominated her mind, ruled out all human help, and blocked the main process of nature.

During the eight days that the infant lived, it was able to reach her breast and nurse only once, for about one minute; and then back it went to its prison, where it died from sheer lack of nourishment.

In 1920, that same history was repeated, except that on this occasion our Veterinary Surgeon, Dr. W. Reid Blair, worked (on the fifth day) for seven hours without intermission to stupefy Suzette with chloroform, or other opiates, sufficiently to make it possible to remove the baby without a fight with the mother and its certain death. Owing to her savage temper all the work had to be done between iron bars, to keep from losing hands or arms, and the handicap on the human hand was too great. Even when Suzette had received chloroform for an hour and twenty minutes, and was regarded as _half dead,_ at the first touch of a human finger upon her thigh she instantly aroused and sprang up, raging and ready for battle.

The whole effort failed. To rope Suzette and attempt to control her by force would have been sheer folly, or worse. In such a struggle the infant would have been torn to pieces.

The second one died as the first one did, and for an awful week we were unable to gain possession of the decomposing cadaver. Suzette knew that something was wrong, and she realized the awful odor, but that idea of defense of her offspring obscured all others. In maintaining her possession of that infant, nothing could surpass the cunning of that ape mother. Will we ever succeed in outwitting her, and in getting one of her babies alive into a baby incubator? Who can say?

THE TRUE MENTAL STATUS OF THE GORILLA

The true mental status of the gorilla was discovered in 1919 and 1920, at 15 Sloane Street, London, by Major Rupert Penny, of the Royal Air Service, and his young relative, Miss Alyse Cunningham. Prior to that time, through various combinations of retarding circumstances, no living gorilla had ever been placed and kept in an environment calculated to develop and display the real mental calibre of the gorilla mind. It seems that an exhibition cage, in a zoological park or garden thronged with visitors, actually tends to the suppression, or even the complete extinguishment, of true gorilla character. The atmosphere of the footlights and the stage in which the chimpanzee delights and thrives is to the gorilla repulsive and unbearable.

Judging by Major Penny's "John," the gorilla wishes to live in a high-class human family, in a modern house, and be treated like a human being! It is now definitely recognized by us, and also by our colleagues in the London Zoological Gardens, that gorillas can not live long and thrive on public exhibition, before great crowds of people, and that it is folly to insist upon trying to compel them to do so. The male individual that lived several years in the Breslau Zoological Garden and attained the age of seven years was a striking exception.

We have had two gorillas at our Park, one of which, a female named Dinah, arrived in good health, and lived with us eleven and one-half months. Her mind was dull and hopelessly unresponsive. She learned next to nothing, and she did nothing really interesting. Other captive gorillas I have known have been equally morose and unresponsive, and lived fewer months than Dinah.

It is because of such animals as Dinah that for fifty years the mental status of the gorilla species has been under a cloud. Until now it has been much misunderstood and unappreciated. Of the few gorillas that have been seen in England and America, I think that all save John have been so morose and unresponsive, _and so undeveloped by companionship and training_, that mentally they have been rated far below the chimpanzee and orang.

Our own Dinah was no exception to the rule. Personally she was a stupid little thing, even when in excellent health. Her most pronounced and exasperating stupidities were shown in her refusal to eat, or to taste, strange food, even when very hungry. Any ape that does not know enough to eat a fine, ripe banana, and will only mince away at the _inner lining_ of the banana skin, is an unmitigated numskull, and hardly fit to live. Dinah was all that, and more. But, alas! We have seen a few stupid human children who obstinately refused even to taste certain new and unknown kinds of food, because they "know" they will not like them! So Dinah was not alone in her childish folly.

At last a chain of circumstances placed an intellectual and sensible gorilla, two years of age, in the hands of a family specially fitted by education and home surroundings to develop its mind and its manners. The results of those efforts have given to the gorilla an entirely new mental status. Thanks to the enterprise and diligence of Major Rupert Penny and Miss Cunningham

in purchasing and caring for a sick and miserable young male gorilla,--a most hazardous risk,--a new chapter in wild-animal psychology now is to be written.

In December, 1918, "John Gorilla" was purchased in a London department store, out of a daily atmosphere heated to 85 degrees, and a nightly condition of solitude and terror. From that awful state it was taken to live in Major Penny's comfortable apartments. John was seriously ill. He was in a "rickety" condition, and he weighed only 32 pounds. With a pure atmosphere, kept at 65 degrees only, and amid good surroundings, he soon became well. He attained such robust health and buoyant spirits that in March, 1921, he stood 40 1/2 inches high and weighed 112 pounds.

At my solicitation Miss Cunningham wrote out for me the very remarkable personal history of that wonderful animal,--apparently the most wonderful gorilla ever observed in captivity. It is a clear, straightforward and convincing record, and not one of its statements is to be for one moment doubted. While it is too long to reproduce here in its entirety, I will present a condensation of it, in Miss Cunningham's own words that will record the salient facts,--with no changes save in arrangement.

Miss Cunningham says:

LONELINESS. "We soon found it was impossible to leave him alone at night, because he shrieked every night, and nearly all night, from loneliness and fear. This we found he had done in the store where he lived before coming to us. He always began to cry directly he saw the assistants putting things away for the night. We found that this loneliness at night was trying on his health and appetite. As soon as possible my nephew had his bed made up every night in the room adjoining the cage, with the result that John was quite happy, and began to grow and put on fat.

TREATMENT. "I fed him, washed his hands, face and feet twice a day, and brushed and combed his hair,--which he would try to do himself whenever he got hold of the brush or comb. He soon got to like all this.

TRAINING. "My next idea was to teach him to be strictly clean in his habits. It was my ambition to be able to have him upstairs in our house as an ordinary member of the household. I taught him first as a child is taught and handled. This took some time. At first I could not make him understand what we expected of him, even though I always petted him and gave him grapes (of which he was especially fond), but I think at first he imagined that this treatment was a punishment. At first, without other reasons, he would roll on the floor and shriek, but directly he understood what was expected of him he soon learned, and began to behave excellently.

"This training occupied quite six weeks. About February, 1919, we took him out of his cage, and allowed him the freedom of the house. Thereafter he would run upstairs to the bathroom of his own accord, turning the doorknob of whatever room he was in, and also opening the door of the bathroom.... He would get out of bed in the night by himself, go back to bed, and pull the blankets over

himself quite neatly.

FOOD. "John's appetite seemed to tire of foods very quickly. The only thing he stuck to was milk, which he liked best when warmed. We began by giving him a quart a day, rising to three and one-half quarts a day. I found that he preferred to choose his own food, so I used to prepare for him several kinds, such as bananas, oranges, apples, grapes, raisins, currants, dates and any small fruits in season, such as raspberries or strawberries, _all of which he liked to have warmed!_

"These displays I placed on a high shelf in the kitchen, where he could get them with difficulty. I think that he thought himself very clever when he stole anything. He never would eat anything stale. He was extremely fond of fresh lemon jelly, but he never would touch it after the second day. He loved roses, _to eat_, more than anything. The more beautiful they were, the more he liked them, but he never would eat faded roses. He never cared much for nuts of any other kind than baked peanuts, save walnuts. I found that nuts gave him dreadful spells of indigestion.

USE OF TOOLS. "He knew what hammers and chisels were for, but for obvious reasons we never encouraged him in anything to do with carpentry. With cocoanuts he was very funny. He knew that they had to be broken, and he would try to break them on the floor. When he found he couldn't manage that, he would bring the nut to one of us and try to make us understand what he wished. If we gave him a hammer he would try to use it on the nut, and on not being able to manage that, he would give back to us both the hammer and the cocoanut.

GAMES AND PLAY. "We never taught him any tricks; he simply acquired knowledge himself. A game he was very fond of was to pretend he was blind, shutting his eyes very tightly, and running around the room knocking against tables and chairs. . . . We found that exercise was the thing he required to keep him in health, and my nephew used to give him plenty of that by playing hide and seek with him in the morning before breakfast, and in the evening before dinner,--up and down stairs, in and out of all the rooms. He simply loved that game, and would giggle and laugh while being chased.... If he saw that a stranger was at all nervous about him, he loved running past him, and giving him a smack on the leg,--and you could see him grin as he did so.

"A thing he greatly enjoyed was to stand on the top rail of his bed and jump on the springs, head over heels, just like a child.

CAUTION. "He was very cautious. He would never run into a dark room without first turning on the light.

FEAR. "John seemed to realize danger for other people in high places, for if anyone looked out of a high window he always pushed them away if he were at the window himself, but if he was away from it he would run and pull them back. . . . He was very much afraid of full-grown sheep, cows and horses, but he loved colts, calves and lambs, proving to us that he recognized youth.

WOODS VS. FIELDS. "We found he did not like fields or open country, but he was very happy in a garden, or in woods. . . . He always liked nibbling twigs, and to eat the green buds of trees.

TABLE MANNERS. "His table manners were really very good. He always sat at the table, and whenever a meal was ready, would pull his own chair up to his place. He did not care to eat a great deal, but he especially liked to drink water out of a tumbler. . . . He was the least greedy of all the animals I have ever seen. He never would snatch anything, and always ate very slowly. He always drank a lot of water, which he would always get himself whenever he wanted it by turning on a tap. Strange to say, he always turned off the water when he had finished drinking.

PLAYING TO THE GALLERY. "John seemed to think that everyone was delighted to see him, and he would throw up the window whenever he was permitted. If he found the sash locked he would unfasten it, and when a big crowd had collected outside he would clap his chest and his hands. [Footnote: In the summer of 1920 a globe-trotter just arrived from England excitedly reported to me: "While driving along a street in London _I saw a live gorilla_ in the upper window of an apartment. It was a _real gorilla;_ and it clapped its hands at us as we looked! Now _what_ did it all mean?" Fortunately I was able to explain it.]

PUNISHMENT AND REPENTANCE. "We made one very great mistake with John. His cage was used as a punishment, with the result that we never could leave him there alone, for he would shriek all the time. . . . Now, a stick was the one thing that our gorilla would not stand from anyone, save Major Penny and myself. Presently we found out that the only way to deal with him was to tell him that he was very naughty, and push him away from us; when he would roll on the floor and cry, and be very-repentant, holding one's ankles, and putting his head on our feet.

AFFECTION FOR A CHILD. "He was especially fond of my little niece, three years old. John and she used to play together for hours, and he seemed to understand what she wanted him to do. If she ever cried, and her mother would not go and pick her up, John would always try and nip the mother, or give her a smack with the full weight of his hand, evidently thinking she was the cause of the child's tears.

A SENSE OF GOOD ORDER. "He loved to take everything out of a wastepaper basket and strew the contents all over the room, after which, when told to do so he would pick up everything and put it all back, but looking very bored all the while. If the basket was very full he would push it all down very carefully, to make room for more. He would always put things back when told to do so, such as books from a bookshelf or things from a table.

[Illustration caption: THE GORILLA WITH THE WONDERFUL MIND Owned by Major Rupert Penny, educated by Miss Alyse Cunningham, London, 1918-1921]

TWO CASES OF ORIGINAL THOUGHT. (1) "One day we were going out, for which I was sitting ready dressed, when John wished to sit in my lap. My sister, Mrs. Penny, said: 'Don't let him. He will spoil your dress.'

"As my dress happened to be a light one I pushed him away, and said, 'No!' He at once lay on the floor and cried just like a child, for about a minute. Then he rose, looked round the room, found a newspaper, went and picked it up, spread it on my lap and climbed up. This was quite the cleverest thing I ever saw him do. _Even those who saw it said they would not have believed it had they not seen it themselves!_ Both my nephews, (Major Penny and Mr. E. C. Penny), his wife and my sister (Mrs. Penny) were in the room, and can testify to the correctness of the above record.

(2) "Another clever thing John did, although I suspect this was due more to instinct than to downright cleverness. A piece of filet beefsteak had just come from the butcher. Inasmuch as occasionally I gave him a small mouthful of raw beef, a small piece of the coarser part of the steak was cut off, and I gave it to him. He tasted it, then gravely handed it back to me. Then he took my hand and put it on the finer part of the meat. From that I cut off a tiny piece, gave it to him, and he ate it. When my nephew came home he wouldn't believe it, so I tried it again, with the same result, except that then he did not even attempt to eat the coarser meat."

* * * * *

Concerning Miss Cunningham's wonderful story, I wish to state that I believe all of it,--because there is no reason to do otherwise! It sets a new mark in gorilla lore, and it lifts a curtain from an animal mind that previously was unknown, and very generally misunderstood.

To the Doubting Thomases who will doubt some portions of Miss Cunningham's story, let me cite, by way of caution, the following history:

When Du Chaillu discovered the gorilla, and came to America and England with his specimens to tell about it, he said that when a big gorilla is attacked and made angry it beats its breast, repeatedly, with its clenched fists. The wiseacres of that day solemnly shook their heads and said: "Oh, no! That can not be true. No ape ever did that. He is romancing!" But now we know that this breast-beating and chest-clapping habit is to a gorilla a common-place performance, even in captivity.

Sometimes there are more things in heaven and earth than are dreamt of in all our philosophy.

XI

THE MIND OF THE ELEPHANT

It was in the jungles of the Animallai Hills of southern India that I first became impressed by the mental capacity of the Indian elephant. I saw many wild herds. I saw elephants at work, and at one period I lived in a timber camp, consisting of working

elephants and mahouts. I saw a shrewd young elephant-driver soundly flogged for stealing an elephant, farming it out to a native timber contractor for four days, and then elaborately pretending that the animal had been "lost." Later on I saw elephant performances in the "Greatest Show on Earth" and elsewhere, and for eighteen years I have been chief mourner over the idiosyncrasies of Gunda and Alice. If I do not now know something about elephants, then my own case of animal intelligence is indeed hopeless.

To me it seems that the only thing necessary to establish the elephant as an animal of remarkable intellect and power of original reasoning is to set forth the unadorned facts that lie ready to hand.

Cuvier recorded the opinion that in sagacity the elephant in no way excels the dog and some other species of carnivora. Sir Emerson Tennent, even after some study of the elephant, was disposed to award the palm for intelligence to the dog, but only "from the higher degree of development consequent on his more intimate domestication and association with man." In the mind of G. P. Sanderson we fear that familiarity with the elephant bred a measure of contempt; and this seems very strange. He says:

"Its reasoning faculties are undoubtedly far below those of the dog, and possibly of other animals; and in matters beyond its daily experience it evinces no special discernment."

To me it seems that all three of those opinions are off the target. The dog is not a wild, untrammelled animal; and neither dogs, cats nor savage men evince any special discernment "beyond the range of their daily experience." Moreover, there are some millions of tame men of whom the same may be said with entire safety.

Very often the question is asked: "Is the African elephant equal in intelligence and training capacity to the Indian species?"

To this we must answer: Not proven. We do not know. The African species never has been tried out on the same long and wide basis as the Indian. Many individual African elephants, very intelligent, have been trained, successfully, and have given good accounts of themselves. For my own part I am absolutely sure that when taken in hand at the same age, and trained on the same basis as the Indian species, the African elephant will be found mentally quite the equal of the Indian, and just as available for work or performances.

No negro tribe really likes to handle elephants and train them. The Indian native loves elephants, and enjoys training them and working with them. It is these two conditions that have left the African elephant far behind the procession. The African elephant belongs to the great Undeveloped Continent. He has been, and he still is, mercilessly pursued and slaughtered for his tusks. All the existing species of African elephants are going down and out before the ivory hunters. We fear that they will all be dead one hundred years from this time, or even less. A century hence, when the last *_africanus_* has gone to join the mammoth and the mastodon, his well protected wild congener in India still will be

devouring his four hundred pounds of green fodder per day, and the tame ones will be performing to amuse the swarming human millions of this overcrowded world.

In the minds of our elephant keepers, familiarity with elephants has bred just the reverse of contempt. Both Thuman and Richards are quite sure that elephants are the wisest of all wild animals.

Despite the very great amount of trouble made for Keeper Thuman by Gunda, the Indian, and Kartoum, the African, Thuman grows enthusiastic over the shrewdness of their "cussedness." He is particularly impressed by their skill in opening chain shackles, and unfastening the catches and locks of doors and gates. And really, Kartoum's ingenuity in finding out how to open latches and bolts is almost inexhaustible, as well as marvelous.

Keeper Richards declares that our late African pygmy elephant, Congo, was the wisest animal he ever has known. I have elsewhere referred to his ability in shutting his outside door. Richards taught him to accept coins from visitors, deposit them in a box, then pull a cord to ring a bell, one pull for each coin represented. The keeper devised four different systems of intimate signals by which he could tell Congo to stop at the right point, and all these were so slight that no one ever detected them. One was by a voice-given cue, another by a hand motion, and a third was by an inclination of the body.

Keeper Richards relates that Congo would go out in his yard, collect a trunkful of peanuts from visitors, bring them inside and secretly cache them in a corner behind his feed box. Then he would go out for more graft peanuts, bring them in, hide them and proceed to eat the first lot. There are millions of men who do not know what it is to conserve something that can be eaten.

In this discussion of the intellectual powers and moral qualities of the elephant I will confine myself to my own observations on Elephas indicus, except where otherwise stated. A point to which we ask special attention is that in endeavoring to estimate the mental capacity of the elephant, we will base no general conclusions upon any particularly intelligent individual, as all mankind is tempted to do in discussions of the intelligence of the dog, the cat, the horse, parrot and ape. On the contrary, it is our desire to reveal the mental capacity of every elephant living, tame or wild, except the few individuals with abnormal or diseased minds. It is not to be shown how successfully an elephant has been taught by man, but how all elephants in captivity have been taught, and the mental capacity of every elephant.

Under the head of intellectual qualities we have first to consider the elephant's

POWERS OF INDEPENDENT OBSERVATIONS, AND REASONING FROM CAUSE TO EFFECT

While many wonderful stories are related of the elephant's sagacity and independent powers of reasoning, it must be admitted that a greater number of more wonderful anecdotes are told on

equally good authority of dogs. But the circumstances in the case are wholly to the advantage of the universal dog, and against the rarely seen elephant. While the former roams at will through his master's premises, through town and country, mingling freely with all kinds of men and domestic animals, with unlimited time to lay plans and execute them, the elephant in captivity is chained to a stake, with no liberty of action whatever aside from begging with his trunk, eating and drinking. His only amusement is in swaying his body, swinging one foot, switching his tail, and (in a zoological park) looking for something that he can open or destroy. Such a ponderous beast cannot be allowed to roam at large among human beings, and the working elephant never leaves his stake and chain except under the guidance of his mahout. There is no means of estimating the wonderful powers of reasoning that captive elephants might develop if they could only enjoy the freedom accorded to all dogs except the blood-hound, bull-dog and a few others.

In the jungles of India the writer frequently has seen wild elephants reconnoitre dangerous ground by means of a scout or spy; communicate intelligence by signs; retreat in orderly silence from a lurking danger, and systematically march, in single file, like the jungle tribes of men.

Once having approached to within fifty yards of the stragglers of a herd of about thirty wild elephants, which was scattered over about four acres of very open forest and quietly feeding, two individuals of the herd on the side nearest us suddenly suspected danger. One of them elevated his trunk, with the tip bent forward, and smelled the air from various points of the compass. A moment later an old elephant left the herd and started straight for our ambush, scenting the air with upraised trunk as he slowly and noiselessly advanced. We instantly retreated, unobserved and unheard. The elephant advanced until he reached the identical spot where we had a moment before been concealed. He paused, and stood motionless as a statue for about two minutes, then wheeled about and quickly but noiselessly rejoined the herd. In less than half a minute the whole herd was in motion, heading directly away from us, and moving very rapidly, but _without the slightest noise_. The huge animals simply vanished like shadows into the leafy depths of the forest. Before proceeding a quarter of a mile, the entire herd formed in single file and continued strictly in that order for several miles. Like the human dwellers in the jungle, the elephants know that the easiest and most expeditious way for a large body of animals to traverse a tangled forest is for the leader to pick the way, while all the others follow in his footsteps.

In strong contrast with the stealthy and noiseless manner in which elephants steal away from a lurking danger, or an ambush discovered, from an open attack accompanied with the noise of fire-arms they rush away at headlong speed, quite regardless of the noise they make. On one occasion a herd which I was designing to attack, and had approached to within forty yards, as its members were feeding in some thick bushes, discovered my presence and retreated so silently that they had been gone five minutes before I discovered what their sudden quietude really meant. In this instance, as in several others, the still alarm was communicated by silent signals, or sign-language.

At the Zoological Park we reared an African pygmy elephant (_Elephas pumilio_). When his slender little tusks grew to eighteen inches in length he made some interesting uses of them. Once when the keepers wished to lead him upon our large platform scales, the trembling of the platform frightened him. He conceived the idea that it was unsafe, and therefore that he must keep off. He backed away, halted, and refused to leave solid ground. The men pushed him. He backed, and trumpeted a shrill protest. The men pushed harder, and forced him forward. Trumpeting his wild alarm and his protest against what he regarded as murder, he fell upon his knees and drove his tusks into the earth, quite up to his mouth, to anchor himself firmly to the solid ground. It was pathetic, but also amusing. When Congo finally was pushed upon the scales and weighed, he left the trembling instrument of torture with an air of disgust and disapproval that was quite as eloquent as words. On several occasions when taken out for exercise in the park, he endeavored to hinder the return to quarters by anchoring himself to Mother Earth.

Congo once startled us by his knowledge of the usefulness of doors. For a time he was kept in a compartment that had an outside door running sidewise on a trolley track, and controlled by two hanging chains, one to close it and one to open it. Each chain had on its end a stout iron ring for a handle. One chilly morning when I went to see Congo, I asked his keeper to open his door, so that he could go out.

The keeper did so, by pulling the right hand chain. The moment the draft of chilly outer air struck Congo, who stood in the centre of his stall facing me, he impatiently wheeled about, walked up to the left hand chain, grabbed it with his trunk, slipped the ring over one of his tusks, then inclined his head downward and with an irritated tug pulled the door shut with a spiteful slam. "Open it again," I said to the keeper.

He did so, and in the same way, but with a visible increase in irritation, Congo closed it in the same manner as before. Again the keeper opened the door, and this time, with a real exhibition of temper Congo again thrust the ring over his tusk, and brought the door shut with a resounding bang. It was his regular habit to close that door, or to open it, when he felt like more air or less air; and who is there who will say that the act was due to "instinct" in a jungle-bred animal, or anything else than original thought. The ring on his tusk was his own invention, as a means to a desired end.

Every elephant that we ever have had has become, through his own initiative and experimenting, an expert in unfastening the latches of doors and gates, and in untying chains and ropes. Gunda always knew enough to attack the padlocks on his leg chains, and break them if possible. No ordinary clevis would hold him. When the pin was threaded at one end and screwed into its place, Gunda would work at it, hour by hour, until he would start it to unscrewing, and then his trunk-tip would do the rest. The only clevis that he could not open was one in which a stout cotter pin was passed through the end of the clevis-pin and strongly bent.

Through reasons emanating in his own savage brain, Gunda took

strong dislikes to several of our park people. He hated Dick Richards,--the keeper of Alice. He hated a certain messenger boy, a certain laborer, a painter and Mr. Ditmars. Toward me he was tolerant, and never rushed at me to kill me, as he always did to his pet aversions. He stood in open fear of his own keeper, Walter Thuman, until he had studied out a plan to catch him off his guard and "get him." Then he launched his long-contemplated attack, and Thuman was almost killed.

Our present (1921) male African elephant, Kartoum, is not so hostile toward people, but his insatiable desire is to break and to smash all of his environment that can be bent or broken. His ingenuity in finding ways to damage doors and gates, and to bend or to break steel beams, is amazing. His greatest feat consisted in breaking squarely in two, by pushing with his head, a 90-pound steel railroad iron used as the top bar of his fence. He knows the mechanism of the latch of the ponderous steel door between his two box stalls, and nothing but a small pin that only human fingers can manipulate suffices to thwart his efforts to control the latch.

Kartoum has gone over every inch of surface of his two apartments, his doors, gates and fences, to find something that he can break or damage. The steel linings of his apartment walls, originally five feet high, we have been compelled to extend upward to a height of nine feet, to save the brick walls from being battered and disfigured. He has searched his steel fences throughout, in order to find their weakest points, and concentrate his attacks upon them. If the sharp-pointed iron spikes three inches long that are set all over his doors are perfectly solid, he respects them, but if one is the least bit loose in its socket, he works at it until he finally breaks it off.

I invite any Doubting Thomas who thinks that Kartoum does not "think" and "reason" to try his own thinking and reasoning at inventing for Kartoum's door a latch that a keeper can easily and surely open and close at a distance of ten feet, and that will be Kartoum-proof. As for ourselves, three or four seemingly intelligent officers and keepers, and a capable foreman of construction, have all they can do to keep ahead of that one elephant, so great is his ingenuity in thwarting our ways and means to restrain him.

In about two days of effort our elephant keepers taught Gunda to receive a coin from the hand of a visitor, or pick it off the floor, lift the lid of a high-placed cash-box, drop the coin into it and ring a bell. This very amusing industry was kept up for several years, but finally it became so popular that it had to be discontinued.

Keeper Dick Richards easily taught Alice to blow a mouth organ, and to ring a telephone, to take the receiver off its hook and hold it to her ear and listen. For years Alice has rendered, every summer, valuable services of a serious nature in carrying children and other visitors around her yard, and only once or twice has she shown a contrary or obstinate spirit.

Tame elephants never tread on the feet of their attendants or knock them down by accident; or, at least, no instances of the

kind have come to my knowledge. The elephant's feet are large, his range of vision is circumscribed, and his extreme and wholly voluntary solicitude for the safety of his human attendants can not be due to anything else than independent reasoning. The most intelligent dog is apt to greet his master by planting a pair of dirty paws against his coat or trousers. The most sensible carriage-horse is liable to step on his master's foot or crowd him against a wall in a moment of excitement; but even inside the keddah, with wild elephants all about, and a captive elephant hemmed in by three or four tame animals, the noosers safely work under the bodies and between the feet of the tame elephant until the feet of the captive are tied.

All who have witnessed the tying of captives in a keddah wherein a whole wild herd has been entrapped, testify to the uncanny human-like quality of the intelligence displayed by the tame elephants who assist in tying, leading out and subjugating the wild captives. They enter into the business with both spirit and understanding, and as occasion requires will deceitfully cajole or vigorously punish a troublesome captive. Sir Emerson Tennent asserts that the tame elephants display the most perfect conception of every movement, both of the object to be attained and the means to accomplish it.

Memory in the Elephant. So far as memory may be regarded as an index of an animal's mental capacity, the weight of evidence is most convincingly creditable to the elephant. As a test of memory in an animal, we hold that a trained performance surpasses all others. During the past forty years millions of people have witnessed in either Barnum's or Ringling Brothers' shows, or in the two combined, an imitation military drill performed by from twelve to twenty elephants which in animals of any other species would be considered a remarkable performance. The following were the commands given by one trainer, understood and remembered by each elephant, and executed without any visible hesitation or mistake. These we will call the

Accomplishments of Performing Elephants.

1. Fall in line.
2. Roll-call. (As each elephant's name is called, he takes his place in the ranks).
3. Present arms. (The trunk is uplifted, with its tip curved forward and held in that position for a short time.)
4. Forward, march.
5. File left, march.
6. Right about face, march.
7. Left about face, march.
8. Right by twos, march.
9. Double quick, march.

10. Single file, march.
11. File right.
12. Halt.
13. Ground arms. (All lie down, and lie motionless.)
14. Attention (All arise.)
15. Shoulder arms. (All stand up on their hind-legs.)

In all, fifteen commands were obeyed by the whole company of elephants.

It being impossible, or at least impracticable, to supply so large a number of animals with furniture and stage properties for a further universal performance, certain individuals were supplied with the proper articles when necessary for a continuation of the performance, as follows:

16. Ringing bells.
17. Climbing up a step-ladder.
18. Going lame in a fore leg.
19. Going lame in a hind leg.
20. Stepping up on a tub turned bottom up.

[Illustration with
caption: TAME ELEPHANTS ASSISTING IN TYING A WILD CAPTIVE The captive elephant is marked "C." The tame elephants have been quietly massed around him to keep him still and to give the noosers a chance to work at his legs from under the bodies of the tame elephants. The black figures on the tame elephants are their mahouts, wrapped in blankets and lying down. (From A. G. R. Theobald, Mysore)]

21. Standing on a tub on right legs only.
22. The same, on opposite legs.
23. The same, on the fore legs only.
24. The same, on the hind legs only.
25. Using a fan.
26. Turning a hand-organ.
27. Using a handkerchief to wipe the eyes.
28. Sitting in a chair.
29. Kneeling, with the fore legs.
30. Kneeling with the hind legs.

31. Walking astride a man lying lengthwise.

32. Stepping over a man lying down.

33. Forming a pyramid of elephants, by using tubs of various sizes.

While it is true that not all of the acts in the latter part of this performance were performed by each one of the elephants who went through the military drill, there is no reason to doubt the entire ability of each individual to be trained to obey the whole thirty-three commands, and to remember them all accurately and without confusion. The most astonishing feature of the performance, aside from the perfect obedience of the huge beasts, was their easy confidence and accuracy of memory.

We come now to a consideration of the Accomplishments of Working Elephants. In all the timber-forests of southern India every captive elephant is taught to perform all the following acts and services, as I have witnessed on many occasions:

1. To _salaam,_ or salute, by raising the trunk.

2. To kneel, to receive a load or a passenger.

3. When standing, to hold up a fore-foot, to serve the driver as a step in climbing to his place.

4. To lie down to be washed, first on one side and then on the other.

5. To open the mouth. 6. To "hand up" any article from the ground to the reach of a person riding.

7. To pull down an obstructing bough.

8. To halt.

9. To back.

10. To pick up the end of a drag-rope and place it between the teeth.

11. To drag a timber.

12. To kneel and with the head turn a log over, or turn it with the tusks if any are present.

13. To push a log into position parallel with others.

14. To balance and carry timbers on the tusks, if possessing tusks of sufficient size.

15. To "speak," or trumpet.

16. To work in harness.

Every working elephant in India is supposed to possess the

intelligence necessary to the performance of all the acts enumerated above at the command of his driver, either by spoken words, a pressure of the knees or feet, or a touch with the driving goad. For the sake of generalization I have purposely excluded from this list all tricks and accomplishments which are not universally taught to working elephants. We have seen, however, that performing elephants are capable of executing nearly double the number of acts commonly taught to the workers; and, while it is useless to speculate upon the subject, it must be admitted that, were a trainer to test an elephant's memory by ascertaining the exact number of commands it could remember and execute in rotation, the result would far exceed anything yet obtained. For my own part, I believe it would exceed a hundred. The performance in the circus-ring is limited by time and space, and not by the mental capacity of the elephants.

Comprehension under Training. When we come to consider the comparative mental receptivity and comprehension of animals under man's tuition, we find the elephant absolutely unsurpassed. On account of the fact that an elephant is about eighteen years in coming to anything like maturity, according to the Indian Government standard for working animals, it is far more economical and expeditious to catch full-grown elephants in their native jungles, and train them, than it is to breed and rear them. About ninety per cent of all the elephants now living in captivity were caught in a wild state and tamed, and of the remainder at least eighty per cent were born in captivity of females that were gravid when captured. It will be seen, therefore, that the elephant has derived no advantage whatever from ancestral association with man, and has gained nothing from the careful selection and breeding which, all combined, have made the collie dog, the pointer and the setter the wonderfully intelligent animals they are. For many generations the horse has been bred for strength, for speed, or for beauty of form, but the breeding of the dog has been based chiefly on his intelligence as a means to an end. With all his advantages, it is to be doubted whether the comprehensive faculties of the dog, even in the most exceptional individuals of a whole race, are equal to those of the adult wild elephant fresh from the jungle.

The extreme difficulty of teaching a dog of mature age even the simplest thing is so well known that it has passed into a proverb: "It is hard to teach an old dog new tricks." In other words, the conditions must be favorable. But what is the case with the elephant? The question shall be answered by G. P. Sanderson. In his "Wild Beasts of India," he says: "Nor are there any elephants which can not be easily subjugated, whatever their size or age. The largest and oldest elephants are frequently the most easily tamed, as they are less apprehensive than the younger ones."

Philosophy of the Elephant in Accepting Captivity and Making the Best of It. The most astounding feature in the education of an elephant is the suddenness of his transition from a wild and lawless denizen of the forest to the quiet, plodding, good-tempered, and cheerful beast of draught or burden. I call it astounding, because in comparison with what could not be done with other wild animals caught when adult, no other word is adequate to express the difference. The average wild animal caught

fully grown is "a terror," and so far as training is concerned, perfectly impossible.

There takes place in the keddah, or pen of capture, a mighty struggle between the giant strength of the captive and the ingenuity of man, ably seconded by a few powerful tame elephants. When he finds his strength utterly overcome by man's intelligence, he yields to the inevitable, and accepts the situation philosophically. Sanderson once had a narrow escape from death while on the back of a tame elephant inside a keddah, attempting to secure a wild female. She fought his elephant long and viciously, with the strength and courage of despair, but finally she was overcome by superior numbers. Although her attack on Sanderson in the keddah was of the most murderous description, he states that her conduct after her defeat was most exemplary, and she never afterward showed any signs of ill-temper.

Mr. Sanderson and an elephant-driver once mounted a full-grown female elephant _on the sixth day after her capture, without even the presence of a tame animal._ Sir Emerson Tennent records an instance wherein an elephant fed from the hand on the first night of its capture, and in a very few days evinced pleasure at being patted on the head. Such instances as the above can be multiplied indefinitely. To what else shall they be attributed than philosophic reasoning on the part of the elephant? The orang-utan and the chimpanzee, so often put forward as his intellectual superior, when captured alive at any other period than that of helpless infancy, are vicious, aggressive, and intractable not only for weeks and months, but for the remainder of their lives. Orangs captured when fully adult exhibit the most tiger-like ferocity, and are wholly intractable.

If dogs are naturally superior to elephants in natural intellect, it should be as easy to tame and educate newly-caught wild dogs or wolves of mature age, as newly-caught elephants. But, so far from this being the case, it is safe to assert that it would be _impossible_ to train even the most intelligent company of pointers, setters or collies ever got together to perform the feats accomplished with such promptness and accuracy by all regularly trained work elephants.

The successful training of all elephants up to the required working point is so fully conceded in India that the market value of an animal depends wholly upon its age, sex, build and the presence or absence of good tusks. The animal's education is either sufficient for the buyer, or, if it is not, he knows it can be made so.

Promptness and Accuracy in the Execution of Man's Orders. This is the fourth quality which serves as a key to the mental capacity and mental processes of an animal.

To me the most impressive feature of a performance of elephants in the circus-ring is the fact that every command uttered is obeyed with true military promptness and freedom from hesitation, and so accurately that an entire performance often is conducted and concluded without the repetition of a single command. One by one the orders are executed with the most human-like precision and steadiness, amounting sometimes to actual nonchalance. Human

beings of the highest type scarcely could do better. To some savage races--for example, the native Australians, the Veddahs of Ceylon, or the Jackoons of the Malay Peninsula, I believe that such a performance would be impossible, even under training. I do not believe their minds act with sufficient rapidity and accuracy to enable a company of them to go through with such a wholly artificial performance as successfully as the elephants do.

The thoughtful observer does not need to be told that the brain of the ponderous quadruped acts, as far as it goes, with the same rapidity and precision as that of an intelligent man,--and this, too, in a performance that is wholly artificial and acquired. In the performance of Bartholomew's horses, of which I once kept a record in detail, even the most accomplished members of his troupe often had to be commanded again and again before they would obey. A command often was repeated for the fifth or sixth time before the desired result was obtained. I noted particularly that not one of his horses,--which were the most perfectly trained of any ever seen by me,--was an exception to this rule, or performed his tasks with the prompt obedience and self-confidence so noticeable in each one of the sixteen Barnum elephants. The horses usually obeyed with tardiness and hesitation, and very often manifested nervousness and uncertainty.

In the mind of the elephant, e. g., each elephant, there was no confusion of ideas or lapses of memory, but, on the contrary, the mental grasp on the whole subject was so secure and comprehensive that the animal felt himself the master of the situation.

I have never yet seen a performance of trained dogs which could be considered worthy of serious comparison with the accomplishments of either performing or working elephants. In the matter of native educational capacity the dog can not on any grounds be considered the rival of the elephant. The alleged mental superiority of the dog is based almost wholly upon his powers of independent reasoning and observation as exhibited in a state of almost perfect freedom. Until the elephant who has grown to maturity under man's influence, is allowed the dog's freedom to plan and execute, no conclusive comparison between them can be made.

Moral Qualities of the Elephant. Finally, we come to a consideration of the elephant's moral qualities that have a direct bearing upon our subject. In India, excepting the professional "rogue," the elephant bears a spotless reputation for patience, amiability and obedience. The "rogue" is an individual afflicted with either an incorrigible disposition, or else is afflicted with insanity, either temporary or permanent. I know of no instance on record wherein a normal elephant with a healthy mind has been guilty of unprovoked homicide, or even of attempting it. I have never heard of an elephant in India so much as kicking, striking or otherwise injuring either human beings or other domestic animals. There have been several instances, however, of persons killed by elephants which were temporarily insane, or "must," and also by others permanently insane. In America several persons have been killed in revenge for ill treatment. In Brooklyn a female elephant once killed a civilian who burned her trunk with a lighted cigar. It is the misfortune but not the fault

of the elephant that in advanced age or by want of necessary exercise, he is liable to be attacked by _must,_ or sexual insanity, during which period he is clearly irresponsible for his acts.

So many men have been killed by elephants in this country that of late years the idea has been steadily gaining ground that elephants are naturally ill-tempered, and vicious to a dangerous extent. Under fair conditions, nothing could be farther from the truth. We have seen that in the hands of the "gentle Hindu" the elephant is safe and reliable, and never attacks man except under the circumstances already stated. In this country, however, many an elephant is at the mercy of quick-tempered and sometimes revengeful showmen, who very often do not understand the temperaments of the animals under their control, and who during the traveling season are rendered perpetually ill-tempered and vindictive by reason of overwork and insufficient sleep. With such masters as these it is no wonder that occasionally an animal rebels, and executes vengeance. In Minneapolis in December an elephant once went on a rampage through the freezing of its ears. I am quite convinced that an elephant could by ill treatment be driven to insanity, and I have no doubt that this has been done many times. Our bad elephant, Gunda, was bad by nature, but finally he became afflicted with sexual insanity, for which there was no cure. When commanded by man, the elephant will tear a criminal limb from limb, or crush him to death with his knees, or go out to battle holding a sword in his trunk. He will, when told to do so, attack his kind with fury and persistence; but in the course of many hours, and even days, spent in watching wild herds, I never yet saw a single individual show any signs of impatience or ill-temper toward his fellows.

It is safe to say that, thus far, not one half the elephant's mental capabilities have been developed, or even understood. It would be of great interest to determine by experiment the full educational capacity of this interesting quadruped. It would be equally interesting to determine the limit of its reasoning powers in applied mechanics. An animal that can turn a hand-organ at the proper speed, or ring a telephone and go through the motions of listening with a receiver, can be taught to push a smoothing-plane invented purposely for him; but whether he would learn of himself to plane the rough surface smooth, and let the smooth ones remain untouched, is an open question.

While it is generally fruitless and unsatisfactory to enter the field of speculation, I can not resist the temptation to assert my belief that an elephant can be taught to read written characters, and also to express some of his own thoughts or states of feeling in writing. It would be a perfectly simple matter to prepare suitable appliances by which the sagacious animal could hold a crayon in his trunk, and mark upon a surface adapted to his convenience. Many an elephant has been taught to make chalk-marks on a blackboard. In Julian's work on "The Nature of Animals," the eleventh chapter of the second book, he describes in detail the wonderful performances of elephants at Rome, all of which he saw. One passage is of peculiar interest to us, and the following has been given as a translation: "...I saw them writing letters on Roman tablets with their trunks, neither looking awry nor turning aside. The hand, however, of the teacher was placed so as to be a

guide in the formation of the letters; and, while it was writing, the animal kept its eye fixed down in an accomplished and scholar-like manner."

I can conceive how an elephant may be taught that certain characters represent certain ideas, and that they are capable of intelligent combinations. The system and judgment and patient effort which developed an active, educated, and even refined intellect in Laura Bridgman--deaf, dumb and blind from birth--ought certainly to be able to teach a clear-headed, intelligent elephant to express at least some of his thoughts in writing.

I believe it is as much an act of murder to wantonly take the life of a healthy elephant as to kill a native Australian or a Central-African savage. If it is more culpable to kill an ignorant human savage than an elephant, it is also more culpable to kill an elephant than an echinoderm. Many men are both morally and intellectually lower than many quadrupeds, and are, in my opinion, as wholly destitute of that indefinable attribute called soul as all the lower animals commonly are supposed to be.

If an investigator like Dr. Yerkes, and an educator like Dr. Howe, should take it in hand to develop the mind of the elephant to the highest possible extent, their results would be awaited with peculiar interest, and it would be strange if they did not necessitate a revision of the theories now common among those who concede an immortal soul to every member of the human race, even down to the lowest, but deny it to all the animals below man.

Curvature in the Brain of an Elephant. There is curvature of the spine; and there is curvature in the brain. It afflicts the human race, and all other vertebrates are subject to it.

In the Zoological Park we have had, and still have, a persistent case of it in a female Indian elephant now twenty-three years of age, named "Alice." Her mental ailment several times manifested itself in Luna Park, her former home; but when we purchased the animal her former owners carelessly forgot to mention it.

Four days after Alice reached her new temporary home in our Antelope House, and while being marched around the Park for exercise, she heard the strident cry of one of our mountain lions, and immediately turned and bolted.

Young as she was at that time, her two strong and able-bodied keepers, Thuman and Bayreuther, were utterly unable to restrain her. She surged straight forward for the front door of the Reptile House, and into that building she went, with the two keepers literally swinging from her ears.

As the great beast suddenly loomed up above the crowd of sightseers in the quiet building, the crowd screamed and became almost panic-stricken.

Partly by her own volition and partly by encouragement, she circumnavigated the turtle-bank and went out.

Once outside she went where she pleased, and the keepers were

quite unable to control her. Half an hour later she again headed for the Reptile House and we knew that she would again try to enter.

In view of the great array of plate glass cases in that building, many of them containing venomous cobras, rattlesnakes, moccasins and bushmasters, we were thoroughly frightened at the prospect of that crazy beast again coming within reach of them.

With our men fighting frantically, and exhausted by their prolonged efforts to control her, Alice again entered the Reptile House. As she attempted to pass into the main hall,--the danger zone,--our men succeeded in chaining her front feet to the two steel posts of the guard rail, set solidly in concrete on each side of the doorway. Alice tried to pull up those posts by their roots, but they held; and there in front of the Crocodile Pool the keepers and I camped for the night. We fed her hay and bread, to keep her partially occupied, and wondered what she would do in the morning when we would attempt to remove her.

Soon after dawn a force of keepers arrived. Chaining the elephant's front feet together so that she could not step more than a foot, we loosed the chains from the two posts and ordered her to come to an "about face," and go out. Instead of doing that she determinedly advanced toward the right, and came within reach of twelve handsome glazed cases of live reptiles that stood on a long table. Frantically the men tried to drive her back. For answer she put her two front feet on the top bar of the steel guard rail and smashed ten feet of it to the floor. Then she began to butt those glass snake cages off their table, one by one.

"Boom!" "Bang!" "Crash!" they went on the floor, one after another. Soon fourteen banded rattlesnakes of junior size were wriggling over the floor. "Smash" went more cases. The Reptile House was in a great uproar. Soon the big wall cases would be reached, and then--I would be obliged to shoot her dead, to avoid a general delivery of poisonous serpents, and big pythons from twenty to twenty-two feet long. The room resounded with our shouts, and the angry trumpeting of Alice.

At last, by vigorous work with the elephant hooks, Alice was turned and headed out of the building. A foot at a time she passed out, then headed toward the bear dens. Midway, we steered her in among some young maple trees, and soon had her front legs chained to one of them. Alice tried to push it over, and came near to doing so.

Then we quickly tied her hind legs together,--and she was all ours. Seeing that all was clear for a fall, we joyously pushed Alice off her feet. She went over, and fell prone upon her side. In three minutes all her feet were securely anchored to trees, and we sat down upon her prostrate body.

At that crowning indignity Alice was the maddest elephant in the world for that day. We gave her food, and the use of her trunk, and left her there twenty-four hours, to think it over. She deserved a vast beating with canes; but we gave her no punishment whatever. It would have served no good purpose.

During the interval we telephoned to Coney Island, and asked Dick Richards, the former keeper of Alice, to come and reason with her. Promptly he came,--and he is still guiding as best he can the checkered destinies of that erring female.

When Alice was unwound and permitted to arise,--with certain limitations as to her progress through the world,--it was evident that she was in a chastened mood. She quietly marched to her quarters at the Antelope House, and there we interned her. But that was not all of Alice. Very soon we had to move her to the completed Elephant House, half a mile away. Keeper Richards said that two or three times she had bolted into buildings at Luna Park; so we prepared to overcome her idiosyncrasies by a combination of force and strategy. I had the men procure a strong rope about one hundred feet long, in the middle of which I had them fix a very nice steel hook, large enough to hook suddenly around a post or a tree.

One end of that rope we tied to the left foot of Charming Alice, and the remainder of the rope was carried out at full length in front of her.

Willingly enough she started from the Antelope House, and Richards led her about three hundred feet. Then she stopped, and disregarding all advice and hooks, started to come about, to return to the Antelope House. Quickly the anchor was hooked around the nearest fence post, and Alice fetched up against a force stronger than herself. She was greatly annoyed, but in a few minutes decided to go on.

Another lap of two hundred feet, and the same act was repeated, without the slightest variation.

This process continued for nearly half a mile. By that time we were opposite the Elk House and Alice had become wild with baffled rage. She tried hard to smash fences and uproot trees.

At last she stood still and refused to move another foot; and then we played our ace of trumps. Near by, twenty laborers were working. Calling all hands, they took hold of that outstretched rope, and heading straight for the new Elephant House started a new tug of war. Every "heave-ho" of that hilarious company meant a three-foot step forward for Gentle Alice,--willy-nilly. As she raged and roared, the men heaved and laughed. A yard at a time they pulled that fatal left foot, into the corral and into the apartment of Alice; and she had to follow it.

Ever since that time, Alice has been permanently under arrest, and confined to her quarters; but within the safe precincts of two steel-bound yards she carries children on her back, and in summer earns her daily bread.

Elephant Mentality in the Jungle. Mr. A. E. Ross, while Commissioner of Forests in Burma, had many interesting experiences with elephants, and he related the following:

A bad-tempered mahout who had been cruel to his work-elephant finally so enraged the animal that it attempted to take revenge. To forestall an accident, the mahout was discharged, and for two

years he completely disappeared. After that lapse of time he quietly reappeared, looking for an engagement. As the line of elephants stood at attention at feeding time, with a score of persons in a group before them, the elephant instantly recognized the face of his old enemy, rushed for him, and drove him out of the camp.

An ill-tempered and dangerous elephant, feared by everybody, once had the end of his trunk nearly cut off in an accident. While the animal was frantic with the pain of it, Mr. Ross ordered him to lie down. As the patient lay in quiet submission, he dressed the wound and put the trunk in rude bamboo splints. The elephant wisely aided the amateur elephant doctor until the wound healed; and afterward that once dangerous animal showed dog-like affection for Mr. Ross.

XII

THE MENTAL AND MORAL TRAITS OF BEARS

Considered as a group, the bears of the world are supremely interesting animals. In fact, no group surpasses them save the Order Primates, and it requires the enrollment of all the apes, baboons and monkeys to accomplish it.

From sunrise to sunrise a bear is an animal of original thought and vigorous enterprise. Put a normal bear in any new situation that you please, he will try to make himself master of it. Use any new or strange material that you please, of wood, metal, stone or concrete, and he will cheerfully set out to find its weakest points and destroy it. If one board in a wall happens to be of wood a little softer than its fellows, with wonderful quickness and precision he will locate it. To tear his way out of an ordinary wooden cage he asks nothing better than a good crack or a soft knot as a starting point.

Let him who thinks that all animals are mere machines of heredity and nothing more, take upon himself the task of collecting, yarding, housing and KEEPING a collection of thirty bears from all over the world, representing from ten to fifteen species. In a very short time the believer in bear knowledge by inheritance only, will begin to see evidences of new thought.

In spite of our best calculations, in twenty-two years and a total of about seventy bears, we have had three bear escapes. The species involved were an Indian sloth bear, an American black bear and a Himalayan black bear. The troublesome three laboriously invented processes by which, supported by surpassing acrobatics, they were able to circumvent our overhanging bars. Now, did the mothers of those bears bequeath to them the special knowledge which enabled them to perform the acrobatic mid-air feat of warping themselves over that sharp-pointed overhang barrier? No; because none of their parents ever saw steel cage-work of any kind.

Universal Traits. The traits common to the majority of bear _species_ as we see them manifested in captivity are the following:

First, playfulness; second, spasmodic treachery; third, contentment in comfortable captivity; fourth, love of water; fifth, enterprise in the mischievous destruction of things that can be destroyed.

The bears of the world are distributed throughout Asia, Borneo, the heavy forests of Europe, all North America, and the northwestern portion of South America. In view of their wonderfully interesting traits, it is surprising that so few books have been written about them. The variations in bear character and habit are almost as wide as the distribution of the species.

There are four books in English that are wholly devoted to American bears and their doings. These are "The Grizzly Bear" and "The Black Bear," by William H. Wright, of Spokane(Scribner's), "The Grizzly Bear," by Enos A. Mills, and "The Adventures of James Capen Adams." In 1918 Dr. C. Hart Merriam published as No. 41 of "North American Fauna" a "Review of the Grizzly and Brown Bears of North America" (U.S. Govt.). This is a scientific paper of 135 pages, the product of many years of collecting and study, and it recognizes and describes eighty-six species and sub-species of those two groups in North America. The classification is based chiefly upon the skulls of the animals.

It is unfortunate that up to date no bear student with a tireless pen has written The Book of Bears. But let no man rashly assume that he knows "all about bears." While many bears do think and act along certain lines, I am constantly warning my friends, "Beware of the Bear! You never can tell what he will do next." I hasten to state that of all the bears of the world, the "pet" bear is the most dangerous.

A Story of a "Pet" Bear. In one of the cities of Canadaa gentleman greatly interested in animals kept a young bear cub, as a pet; and once more I say--if thine enemy offend thee, present him with a black-bear cub. The bear was kept in a back yard, chained to a post, and after his first birthday that alleged "pet" dominated everything within his circumpolar region.

One day a lady and gentleman called to see the pet, to observe how tame and good-natured it was. The owner took on his arm a basket of tempting apples, and going into the bear's territory proceeded to show how the Black One would eat from his owner's hand.

The bear was given an apple, which was promptly eaten. The owner reached for a second, but instead of accepting it, the bear instantly became a raging demon. He struck Mr. C. a lightning-quick and powerful blow upon his head, ripping his scalp open. With horrible growls and bawling, the beast, standing fully erect, struck again and again at his victim, who threw his arms across his face to save it from being torn to pieces. Fearful blows from the bear's claw-shod paws rained upon Mr. C.'s head, and his scalp was almost torn away. In the melee he fell, and the bear pounced upon him, to kill him.

The visiting gentleman rushed for a club. Meanwhile the lady visitor, rendered frantic by the sight of the bear killing her host, did a very brave but suicidally dangerous thing. She seized the hindquarters of the bear, gripping the fur in her bare hands, and actually dragged the animal off its victim! Fortunately at that dangerous juncture the lady's husband rushed up with a club, beat the raging animal as it deserved, and mastered it.

The owner of the bear survived his injuries, and by a great effort the surgeons saved his scalp. A "pet" bear in its second year may become the most dangerous of all wild animals. This is because it seems so affectionate and docile, and yet is liable to turn in one second,--and without the slightest warning, --into a deadly enemy.

Scores of times we have seen this quick change in temper take place in bears inhabiting our dens. Four bears will be quietly and peacefully consuming their bread and vegetables when,-- "biff!" Like a stroke of lightning a hairy right arm shoots out and lands with a terrific jolt on the head of a peaceful companion. The victim roars,--in surprise, pain and protest, and then a fight is on. The aggressor roars and bawls, and follows up his blow as if to exterminate his perfectly inoffensive cage-mate.

Mean and cruel visitors are fond of starting bear fights by throwing into the cages tempting bits of fruit, or peanuts; and sometimes a peach stone kills a valuable bear by getting jammed in the pyloric orifice of the stomach.

The owners of bears should **NEVER** allow visitors to throw food to them. Unlimited feeding by visitors will spoil the tempers of the best bears in the world.

Power of Expression in Bears. Next to the apes and monkeys, I regard bears as the most demonstrative of all wild animals. The average bear is proficient in the art of expression. The position of his ears, the pose of his head and neck, the mobility of his lips and his walking or his resting attitudes all tell their story.

To facial and bodily expression the bear adds his voice; and herein he surpasses most other wild animals! According to his mood he whines, he threatens, or warns by loud snorting. He roars with rage, and when in pain he cries, or he bawls and howls. In addition to this he threatens an enemy by snapping his jaws together with a mighty ominous clank, accompanied by a warning nasal whine. An angry bear will at times give a sudden rake with his claws to the ground, or the concrete on which he stands. Now, with all this facility for emotional expression, backed by an alert and many-sided mind, boundless energy and a playful disposition, is it strange that bears are among the most interesting animals in the world?

Bears in Captivity. With but few exceptions the bears of the world are animals with philosophic minds, and excellent reasoning power, though rarely equal to that of the elephant. One striking proof of this is the promptness with which adult animals accept comfortable captivity, and settle down in contentment.

What we mean by comfortable captivity very shortly will be defined.

No bear should be kept in a cage with stone walls and an uneven floor; nor without a place to climb; and wherein life is a daily chapter of inactive and lonesome discomfort and unhappiness. The old-fashioned bear "pit" is an abomination of desolation, a sink-hole of misery, and all such means of bear torture should be banished from all civilized countries.

He who cannot make bears comfortable, contented and happy should not keep any.

A large collection of bears of many species properly installed may be relied upon to reveal many variations of temperament and mentality, from the sanguine and good-natured stoic to the hysterical demon. Captivity brings out many traits of character that in a wild state are either latent or absent.

Prominent Traits of Prominent Species. After twenty years of daily observation we now know that

The grizzly is the most keen-minded

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