for short) that has such a precisely descriptive and stable system of nomenclature as chemistry.

The chemist, if diligent, can make at least one new compound every day or so and in his spare moments give it a name. Often it is easier than deciding what to call a new baby. The name he gives will generally stick, because only on rare occasions does some other chemist come along and show that the harness got twisted when the radicals were hitched up. Then all that is needed is to rearrange the component parts of the name or to substitute "ortho" for "para" or "meta."

The name tells what the substance is. Doubt arises when a short and easy name is applied. For the chemist a good name is rather to be chosen than great wealth of description, because it is self-contained. The naturalist must have detailed descriptions, preferably with plates, and is happiest when he can make comparison with "type specimens."

In his spare moments the botanist or zoologist digs around in old books and journals with the hope of resurrecting an old name for some familiar plant or animal. This is called stabilizing the nomenclature. It is done because such and such a congress decided that the race for supremacy and final adoption shall be won, not by a name that has come swiftly down the years and is known by all, but by one that stayed at scratch, hidden in some dusty volume.

Shuffling the cards for a new deal is another delightful diversion. For such names as X..... a..... (Smith) Jones *comb. nov.* special honors are awarded, particularly to Jones. The pity of it is that somebody else may come along and soon the specimen becomes Y..... b..... (Brown) White *comb. noviss.* In this way the nomenclature becomes fixed.

What is queer about a chemical spelling match? To name a compound for which the formula is given, or to do the reverse, is good training for the memory. Can one imagine a botanical or an entomological spelling match? Could "aster" or "grasshopper" be drawn in recognizable detail by the contestants? The optimistic chemist will concede that the respective drawings could with some confidence be labelled "flower" or "bug," but could an expert name the species? Yet the pitifully unscientific chemist who uses long words to cloak his ignorance can at once tell the correct names of two such closely related species as H_2SO_3 and H_2SO_4.

C. E. WATERS

WASHINGTON, D. C.
OCTOBER 27, 1922

MUSCINA PASCUORUM MEIGEN IN NEW ENGLAND

THIS European fly has made its appearance in considerable numbers this year in Massachusetts and Connecticut. The first specimen was collected in Connecticut, August 6, and it is still (November 14) quite common in the vicinity of Boston. The muscid is about three times the size of the house fly, bluish black, with a whitish, pruinose covering. A detailed account is in preparation and any information as to its further distribution will be greatly appreciated.

CHARLES W. JOHNSON
BOSTON SOCIETY OF NATURAL HISTORY

SCIENTIFIC BOOKS

The Minds and Manners of Wild Animals. By WILLIAM T. HORNADAY, Sc.D., A.M. New York: Charles Scribner's Sons, 1922. Pp. x + 328.

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.

With these reflections, the dean of scientific directors of American zoological parks presents his volume on the minds and manners of wild animals. And with the following picture —reproduced here only in part—the curtain falls:

On one side of the heights above the River of

Life stand the men of this little world—the fully developed, the underdone, and the unbaked, in one struggling, seething mass. On the other side, and on a level but one step lower down, stands the vanguard of the long procession of "Lower" Animals, led by the chimpanzee, the orang and the gorilla. The natural bridge that *almost* spans the chasm lacks only the keystone of the arch. . . . .

The great Apes have traveled up the River of Life on the opposite side from Man, but they are only one lap behind him. Let us not deceive ourselves about that. Remember that truth is inexorable in its demands to be heard.

Into this book Dr. Hornaday has put much of his philosophy of life as well as the choicest of his observations on the behavior of wild animals in nature and in captivity. The moral purpose which impelled the writer to expression is the defense of dumb creatures. Our author takes special pains to humble man by dwelling on his shortcomings. The reader is told that, though endowed richly with mind and gifts of expression and therefore capable of noble achievement in service and self-development, man at his worst is the most bestial of animals and more brutal than the so-called brutes.

"The minds and manners of wild animals" will disappoint not a few scientific students of animal behavior because it is not an exact systematic and analytic description of animal experience and action. It will delight almost everyone else by its directness, sincerity and naturalness. For the tens of readers who may get next to nothing from the book because of the "experimentalist bias"—to which the reviewer must plead somewhat guilty—there will be thousands who gain useful knowledge, insight and a more intelligent appreciation of wild animals.

The book should be taken, in the opinion of the reviewer, as a notable contribution to natural history, not as a scientific treatise on comparative psychology. It contains a wealth of amusing, interesting, thrilling and enlightening incidents and personal observations, a somewhat biographical assemblage of reflections and conclusions and a unique thought-provoking collection of brief characterizations of animal intelligence and temperament. Such is the contribution to animal behavior and rights which Dr. Hornaday has made from his almost unexampled wealth of experience as zoologist, hunter and scientific director of zoological gardens. The information presented should be of very considerable practical value to all who have to do with wild animals.

It would be a profitless task to discuss in SCIENCE the scientific grounds of dissatisfaction with a book which is primarily an account of personal experiences with wild animals. Conspicuous among them are terminology, definition, canons of judgment, inferences and generalizations. Such matters every scientific reader will note, but will he nevertheless be able, as the layman almost certainly will, to enter into and profit by the author's lifetime of intimate contact with wild animals? Let us hope so.

More to the point than a recital of the content of this volume is the injunction, "Read it and thus enter into the author's knowledge, sympathetic appreciation and insights." Truth is great. The ways of observing it are as varied as human intellect and temperament. It were a pity to lose the value of the naturalistic in our praiseworthy attempts to exalt the experimental study of animal behavior and experience.

ROBERT M. YERKES

SPECIAL ARTICLES

PROOF OF THE POWER OF THE WHEAT PLANT TO FIX ATMOSPHERIC NITROGEN

IN a series of wheat cultures in solutions, we have recently proved conclusively that wheat plants, even in only six weeks of growth, can fix large quantities of nitrogen from the air. They possess this power whether nitrogen is supplied to the roots or not.

Seventeen years ago, Jamieson[1] made the startling announcement, based on experiments, that all green plants possess the power of fixing atmospheric nitrogen. He supplemented this announcement by another to the effect that

[1] *Report of Agr. Res. Assn.*, Aberdeen, 1905, *et seq.*