THE PRESERVATION OF NATURAL AREAS EXEMPLIFYING VEGETATION TYPES

DR. VAN NAME'S specific criticism of the United States Forest Service in the third and fourth paragraphs of his discussion, "Need for the Preservation of Natural Areas Exemplifying Vegetation Types" in SCIENCE of May 2, 1941, page 423, and in his reply to Dr. Baldwin, SCIENCE, July 18, is both inaccurate and unjust. Many of his statements are easily refutable by any one willing to make a fair and impartial examination of the facts.

Directly contrary to the statement which Van Name makes, the so-called "primitive areas" which the Forest Service has established do not have to "first pass a searching test for absolute commercial worthlessness before selection"; neither are they "nearly or quite treeless." The National Forest wilderness, primitive and roadless areas, which are now generally referred to as wilderness areas, were set aside to preserve primitive conditions of transportation and habitation in which the works of man would not intrude upon those desiring wilderness recreation. In accordance with good land use planning practice these areas, it is true, are largely in the high back country and care was taken to choose areas with no outstanding commercial values, but the areas do include millions of acres of timber land of all age classes and of many species and types. A considerable portion of this timber is mature and over-mature virgin stands, the low commercial value of which is the result of inaccessibility, not the condition or size of the timber, because much of it would be of great commercial value if it were more accessible. From a scientific standpoint, it does not appear that the low commercial value of this timber is any drawback since it is just as valuable for ecological study purposes as though it were worth $10.00 per thousand board feet. National Forest Wilderness areas number 70 and include 14,000,000 acres, a very appreciable acreage certainly not indicative of lack of interest. A list of these areas and a map showing their location was published in *The Living Age* for July, 1940 (Vol. 5, No. 5).

More important from the standpoint of preserving natural areas exemplifying vegetation types, the point with which Van Name is primarily concerned, are the 41 natural areas on the National Forests, containing approximately 50,000 acres. Representatives of over 20 major forest types are included in this series. These areas are specially reserved to preserve permanently in an unmodified condition areas representative of the virgin growth of each forest or range type within each forest region so far as they are represented within the National Forests, to the end that its characteristic plant and animal life and soil conditions, the factors influencing its biological complex, shall continue to be available for purposes of science, research and education.

The existence of these areas and the more than ten-year-old policy under which they have been established directly contradict Van Name's assertion that the United States Forest Service has failed to recognize its obligation to the American public in setting aside such areas. Although set aside to preserve for scientific study typical examples of major vegetative types, particularly timber, in a virgin or as near virgin condition as can be obtained, and not necessarily to preserve merely areas of large trees or high scenic value, these natural areas do contain magnificent examples of big trees and mature or over-mature stands of high scenic and inspirational value. A list of these natural areas will appear in an early number of *Ecology*.

As the writer stated last December, in a report before a joint meeting of the Committee for the Study of Plant and Animal Communities, and the Committee for the Preservation of Natural Conditions of the Ecological Society of America, at Philadelphia, the Forest Service does not consider the present system of natural areas within the National Forests as complete, and additional ones will be added. Suggestions from ecologists and other competent individuals and organizations as to desirable areas and types of vegetation needed for completeness will be welcomed. Nevertheless, the Forest Service does feel that the set of natural areas mentioned above, probably the largest by far set aside by any one organization with the primary purpose of preserving natural vegetation for scientific study, is a forward step which, incomplete though it may be, deserves the understanding and support of scientists, particularly ecologists.

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MAN'S BIOLOGICAL OUTLOOK

IN recent issues of SCIENCE, Professor Eliot Blackwelder (April 18, 1941, pp. 364–366) and Professor H. D. Goodale (June 27, 1941, p. 618) have discussed the subject of man's probable future as a mammalian species. Professor Blackwelder asks the question (p. 366) ". . . will his [future man's] life and conduct be controlled by his intellect rather than by his feelings?" and Professor Goodale replies that recent work on animal and plant improvement "demonstrates that man holds his biological destiny in his own hands."

Neither of these writers, however, gives consideration to three factors in the problem of man's racial future that may be the most vital of all, namely (1) that man, physically and considered as a mammalian

species or genus, is one of the few living giants in the extensive group of mammals (Primates) to which he belongs, (2) that man's physical structure, both skeletal and visceral, has numerous well-known and much-discussed peculiarities that, like his gigantism, show him to be far advanced in the period of "phylogeronty" or racial old age, while (3), in his mental constitution man unites the dominating type of social behavior that is common to most anthropoid primates (well described by Yerkes and his associates) with such a unique genius for "implementing" it as to make the combination a totally new phenomenon in animal evolution. This combination may well prove to be, in the end, as racially lethal as the huge size and great bodily specialization of titanotheres, proboscidians and dinosaurs appears to have been in the past.

Though the idea of racial death as the normal end of every evolutionary line is not a new one, it is seldom given the place it deserves in the discussion of man's future. Professor Blackwelder alludes to it (p. 365), but Professor Goodale is silent on the subject. As an exception to this rule I may quote from an article entitled "A Palaeontologist Looks at Life," by Professor Herbert Leader Hawkins:

> . . . The conclusion seems inevitable that simplicity is safe and complexity is dangerous. But if the main tendency of evolution is toward specialization then evolution leads inevitably to extinction. The rates of progress may vary, but the destination is the same. . . . And yet there is nothing strange in the contention . . . are we not aware that we [as individuals] are living in the constant anticipation of death sooner or later?[1]

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THE LAW OF URBAN CONCENTRATION

ON page 19 of the July 4th issue of SCIENCE, E. L. Thorndike, in reviewing G. K. Zipf's book on "National Unity and Disunity," referring to his discovery of the law of urban concentration, remarks, "This discovery may rank with Quetelet's discovery that the statures of men are distributed in accordance with the so-called normal probability curve."

This discovery is neither new, nor perhaps quite as striking as Professor Thorndike seems to indicate. That the size of cities and their rank when plotted on doubly logarithmic paper form essentially a straight line, seems to be first indicated by F. Auerbach, and was shown to apply to the cities of the United States in my book, "Elements of Physical Biology," 1925, pages 306–307. That a relation of this sort is not uncommon is a well-known fact, the outstanding example perhaps being Pareto's law of the frequency distribution of incomes. Another example is Williss's "Theory of Age and Area," as applied to the frequency of biological genera and species (see *loc. cit.*, pages 311, *et seq.*). Still another example is the Frequency Distribution of Scientific Productivity, as shown by me in the *Journal* of the Washington Academy of Sciences, 1926, Vol. 16, page 317. From this last source, I may quote the following sentence (page 323): "Frequency distributions of this general type have a wide range of applicability to a variety of phenomena, and the mere form of such a distribution throws little or no light on the underlying physical relations." This type of frequency distribution is, in fact, Pearson's type XI, a special case of type VI.

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DR. LOTKA is right in giving to Auerbach the credit that I gave to Zipf; and I apologize for my ignorance of Lotka's discussions of curves which use ranks and are based on the extreme value of the series. Very likely he is right also in regarding them as relatively unimportant cases of curves of extreme skew, but I still hope that they will be more than that.

E. L. THORNDIKE

SCIENTIFIC BOOKS

ENDOCRINOLOGY

Endocrinology. The Glands and Their Functions. By R. G. HOSKINS, M.D. 388 pp. New York: W. W. Norton and Co. 1941. $4.00.

AMONG the many notable advances in the field of the biological sciences in the last fifty years none has been more spectacular than that relating to the endocrine glands. Unfortunately, much that has been written concerning these organs reflects more the enthusiasm of the investigator than it contributes to the advancement of knowledge, and this has been particularly true in the field of clinical endocrinology.

While the remarkable effects of small quantities of certain hormones upon bodily function are a continued source of wonder, a full appreciation of their action is not gained unless the function of the endocrine glands is projected against the operation of the organism as a whole. Until it was clearly recognized that the endocrine glands operate as an integrated system, largely controlled by the anterior pituitary, there was a tendency to believe that they possessed an autonomy of action that set each individual member apart from the others. Even more deplorable was the undue emphasis placed on the hormone as an entity without recognizing that the tissue or tissues upon which it acts

[1] *Proc. Cottswold Naturalist's Field Club*, vol. 33, pt. 3, p. 223, 1929, December, 1930.