Benjamin Franklin fought and defeated France, Spain and England, in Paris, in 1783, when they sought to set the limits of the United States at the southern shores of these bodies of water; but he has been thwarted now by a generation of statistical geographers in our own country who seem to consider the 60,000 square miles of American-owned Great Lakes water nothing but a general nuisance, who have discounted and discredited it, and even disregarded it completely.

This water right now is bearing the most important traffic in the world. Save for the iron ore which must pass over our Great Lakes, the Allied Nations could hold up their hands in complete surrender. Compare the value of this region—now excluded by arbitrary dictum from the total area figures of the Great Lakes States and the United States—with the hundreds of thousands of useless acres of land which are counted in the area of other states such as Texas.

The press of Michigan and Wisconsin has strongly advocated the correction. The best legal opinion in the country says that the case for the Great Lakes States is clearly proven and unanswerable. The Committee on Constitutional Revision in Michigan will include the accurate total area of Michigan in the new constitution of that state.

The Bureau of the Census can correct the situation in the world's reference books by a simple revision of its major area table. Sooner or later this will have to be done.

Meanwhile every one concerned with accurate knowledge rather than the exigencies of statistics will wish to correct his atlas as follows:

TOTAL AREA IN SQUARE MILES

Illinois	57,926 (land,	55,947; water,	1,979)
Indiana	36,519 (land,	36,205; water,	314)
Michigan	96,791 (land,	57,022; water,	39,769)
Minnesota	86,280 (land,	80,009; water,	6,271)
New York	53,203 (land,	47,929; water,	5,274)
Ohio	44,679 (land,	41,122; water,	3,557)
Pennsylvania	46,068 (land,	45,045; water,	1,023)
Wisconsin	66,216 (land,	54,715; water,	11,501)
UNITED STATES ..	3,082,809 (land,	2,977,128; water,	105,681)

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MISUSE OF THE TERMS "CLASS DISTINCTION" AND "DEMOCRACY"

PROFESSOR MAST'S letter on page 465 of the May 21, 1943, issue of SCIENCE misuses these two terms. Regardless of its validity, no recognition of outstanding ability can properly be called "class distinction." Certainly no one should think that a democracy implies a group of individuals either having absolutely uniform ability or a pretense at such uniform ability such as would be implied by the elimination of all marks of recognition for outstanding ability. A literal and logical acceptance of the plea to eliminate "starring" of names in the biographical directory of American Men of Science would mean the abolition of all honorary societies, all medals and awards, and, in fact, all recognition of outstanding ability and achievement.

The means by which "stars" are awarded in the various editions of the biographical directory may not be perfect, but it is probably the most "democratic" method by which any recognition of outstanding achievement may be determined.

As to a referendum on "starring" scientists, I would hazard the guess that while many of those with "stars" might vote against the system there would be an overwhelming majority in favor of the system from those not so "decorated."

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THE DISCOVERY OF "STARS"—A PRESENT PROBLEM

I HAVE been interested in the discussion of the "stars" in SCIENCE, believing that such discussion is wholesome. I have heard of Americans being called "dollar chasers" abroad, and I have seen "money grubbers" myself and I have assumed that a broader American culture would supply a wider variety of goals for man to strive for. Hence I have seen no harm in prizes, academic honorary degrees, societies with honorary memberships and even those with qualified membership, since they are supposedly awarded for personal merit. Every one will recognize that a quiet Willard Gibbs might in any generation be overlooked by an Academy of Sciences in its elections. Nevertheless, the peers of such a Willard Gibbs should be the best qualified to locate the "stars" of their generation.

It is of great benefit to the public that the star is located because (1), his productivity may thereby be enhanced, either by the encouragement or by increased facilities afforded; (2) his work may be more certainly preserved for posterity; (3) their results may be utilized, and his work used for the emulation of others.

It is not a question of personal vanity at all. It is not a matter of concern whether the ancestors of Gibbs came over on the *Mayflower* or were aborigines. It is rather what he did, how well we can use those results and what we can learn from his life. Mozart, Schubert and Poe were indeed stars, but it is difficult to believe that neglect on the part of the public of their period made them great. On the other hand, we instinctively feel that our neglect caused the loss of invaluable treasures of music and art.

It is a matter of merely enlightened self-interest for society to seek out a Wallace Carothers and afford him the most suitable surroundings for his genius to work in. How to do that is a problem that science may well ponder.

EUGENE C. BINGHAM

SCIENTIFIC BOOKS

VIRUS DISEASES

Virus Diseases. By Members of the Rockefeller Institute for Medical Research, THOMAS M. RIVERS, W. M. STANLEY, L. O. KUNKEL, R. E. SHOPE, F. L. HORSFALL, JR., PEYTON ROUS. Ithaca, N. Y.: Cornell University Press. 1943. $2.00.

THE title of the volume suggests a text-book. In the technical sense this is far from the case but, in content, a more illuminating insight into experimental thinking could scarcely be devised. The book comprises the Messenger Lectures on the Evolution of Civilization delivered by six members of the Rockefeller Institute at Cornell University in the spring of 1942, said lectures having "the special purpose of raising the moral standard of our political, business, and social life." Although each lecturer deals with specific aspects of the virus problem in which he has been engaged, the composite view is a varied approach to the broad biological problem of the nature of viruses and their modes of action.

In the first of the series, "Virus Diseases with Particular Reference to Vaccinia," T. M. Rivers reviews the concerted efforts to characterize vaccine virus by analysis of its antigenic, physical and chemical properties. Following the principles which have yielded such valuable information of bacterial action, the newer methods of immunochemistry, biochemical assay, enzymatic identification and physical measurements, have been employed by associates and collaborators of special skills with the result that many properties of vaccine virus in the form of elementary bodies have been determined. The manifold attack has revealed a multiplicity of antigens and the presence of chemical substances such as biotin and flavin which suggest the animate nature of the virus; it has also disclosed limitations in the interpretation of homogeneity on the basis of centrifugal or electrophoretic boundaries. The whole story is highly instructive and attractive reading.

Under the title of "Chemical Structure and the Mutation of Viruses," W. M. Stanley tells of the attempts in his laboratory to induce mutants or variants of tobacco mosaic virus by chemical alterations of the virus protein. Having determined that certain strains of the virus differed in their content of certain amino acids, it was suggested that the variations in behavior were related to these differences. Accordingly, virus chemically modified by extensive coverage of the amino and phenol groups was inoculated onto susceptible plants in the hope that the virus produced in the infected plant would resemble the modified material. This was not the case; the resultant virus was similar in nearly all respects to the usual tobacco mosaic virus; however, it was found that the virulence of the virus for a different host was decreased. Chemical treatment beyond a certain point destroyed activity. The studies represent the beginning of a stimulating approach to the fundamental problem of biological variation.

The need for transmission of the agent of an infectious disease of man to new hosts in order to study it adequately is obvious. It may come as a surprise to many that great advantages accrue to the same procedure in the investigation of virus diseases of plants. L. O. Kunkel in the lecture, "New Hosts as a Key to Progress in Plant Virus Disease Research," gives numerous examples of the benefits to be gained: the recognition of unsuspected mixed infections, the attenuation or exaltation of a virus, the appearance of otherwise unexpected properties, and the transfer to new hosts by way of an intermediate plant host, are some of them. The latter procedure has recently proved a notable success in the transfer of viruses which previously had been transmissible only by grafting. The lecture contains numerous implications of importance to the entire field of infection and adaptation.

The attention of investigators of virus diseases has been constantly attracted to Shope's studies of swine influenza. The first part of the present lecture is devoted to reviewing the history and earlier studies leading to the identification of the complex virus-bacterial nature of the disease. The remainder deals with the problem of the origin of epizootics and the residence of the virus in interepizootic periods. A summary is given of the evidence that the virus in masked form is maintained in the lung worms from infected hogs through their developmental cycle in the intermediate earthworm host and back to residence in the lungs of normal swine where proper stimuli serve to activate the virus and incite infection of the animal. The thesis clearly provides a reservoir and an explanation for the sudden reappearance of the disease in wide areas after many months of absence. The analogies and implications for human disease are discussed. In this instance again, the ingenious and skilful experimentation of the investigator are disclosed in relation to a concept, the significance of which extends beyond the biological confines of the disease primarily discussed.