vice, and for forty years on the payroll of the government, describes the scheme one would expect of a Totalitarian State or the U. S. S. R. What is the country coming to when its servants in high places propose "central agencies" for sorting and distributing the "contributions of the workers" and "eliminating some journals" for the "advancement of science and the public welfare"? How about the public welfare being served by individual enterprise and the freedom of the press? Give me the horse-and-buggy days, and leave for Europe the advancement of State Socialism.

RICHARD L. SUTTON, JR.

KANSAS CITY, MO.

THE PLANNING COMMITTEE OF THE VIRGINIA ACADEMY OF SCIENCE

THE Virginia Academy of Science, with its thousand members from all fields of science and from prominent lay groups in the state, is to have a long-range planning committee to help make its usefulness to the state and nation more effective in these defense times and in the future. In addition, this committee will have a group of prominent Virginians as consultants, their names to be announced later.

The personnel of the long-range planning committee appointed by Wortley F. Rudd, president of the academy, follows:

Arthur Bevan, state geologist; L. C. Bird, president of Phipps and Bird, Inc.; Raymond B. Bottom, publisher of the *Daily Press* and *Newport News Times Herald*; Dr. Julian A. Burruss, president of the Virginia Polytechnic Institute; Francis S. Chase, executive secretary of the Virginia Education Association; Justus H. Cline, chairman, board of directors of the Virginia Wildlife Association; Virginius Dabney, editor of the *Richmond Times-Dispatch*; Dr. Frank A. Geldard, professor of psychology, University of Virginia; Dr. Meta Glass, president of Sweet Briar College; Dr. Sidney B. Hall, state superintendent of public instruction; Dr. William R. Harlan, assistant director of research, American Tobacco Company; Dr. J. Shelton Horsley, surgeon; W. Catesby Jones, chief chemist, State Department of Agriculture; Dr. Ivey F. Lewis, dean of the University of Virginia; H. K. McConnell, vice-president, Tobacco By-Products and Chemical Corporation; Robert F. Nelson, publicity director for the Virgina State Chamber of Commerce; Dr. Garnett Ryland, head of the department of chemistry, University of Richmond; R. M. Sanford, assistant director of the State Planning Board; Dr. I. A. Updike, head of the department of chemistry, Randolph-Macon College, with other officers of the academy besides Dean Rudd and E. C. L. Miller as *ex-officio* members; Dr. George W. Jeffers, president-elect and professor of biology at Farmville State Teachers College, and Dr. Sidney S. Negus, head of the department of chemistry, Medical College of Virginia.

This long-range planning committee will soon have its organization meeting and begin considering various scientific problems of Virginia which have been suggested during a comprehensive survey extending over the last four months and just completed. Some 1,200 persons were consulted by the president of the academy in this survey.

E. C. L. MILLER,
Secretary-Treasurer

SCIENTIFIC BOOKS

THE THEORY OF PROBABILITY

Theory of Probability. By HAROLD JEFFREYS. Oxford: published by the Clarendon Press. 1939.

THE purpose of this book is to construct a foundation for scientific method and to analyze inductive reasoning. The problem is attacked with the aid of the theories of probability and statistics. The author gives a set of postulates for the theory of probability. These postulates specify certain relations between implication and probabilities and demand that probabilities shall constitute a completely ordered set. Probabilities are interpreted as "degrees of reasonable belief" and are distinguished from the numbers which represent them. Number is introduced by means of two conventions and one additional postulate. These conventions do not require that certainty be represented by the number one. In fact on occasions the author finds it convenient to represent certainty by infinity. On the basis of the postulates and the conventions the usual results of the theory of probability are derived. The author discusses estimation problems and significance tests with the aid of Bayes's principle and the following rules: "If the parameter may have any value in a finite range, or from $-\infty$ to $+\infty$, its prior probability should be taken as uniformly distributed. If it arises in such a way that it may conceivably have any value from 0 to ∞, the prior probability of its logarithm should be taken as uniformly distributed." He devotes considerable attention to the justification of these rules. The latter part of the book is concerned with general questions, including a discussion of the frequency theory and other foundations for the theory of probability.

Let us note that science and indeed all inductive thinking are vitally concerned with predictions. The first few pages of this book furnish a strong support for this claim. In the pages which follow Jeffreys

develops methods for estimating our degrees of belief in such predictions, but he fails to show how these degrees of belief are related to the successes and failures (or anticipated successes and failures) of the predictions. This neglect is characteristic of those who interpret probabilities in terms of mental states. In fact, the objection to such an interpretation is that it tends to conceal this fundamental problem. This problem is important. For if degrees of belief should give no adequate characterization of anticipated successes and failures, then they could have no important connection with such successes and failures. Perhaps this seems trivial, but it readily follows that without such characterization degrees of belief would be of no importance in science or inductive thinking. Fortunately, however, it is possible to obtain a consistent non-trivial characterization of probabilities in terms of anticipated successes and failures. I have done this in an article published in *Erkenntnis*. In view of this possibility the above objection would not be serious if it were not for two additional difficulties. First, my characterization was accomplished with the aid of the statistical theory to which the author violently objects and, second, the failure to consider the question which I have raised has led to some very questionable reasoning in connection with the representation of certainty by infinity. It is of course conceivable that one could develop a theory of probability which was based on such an infinite scale and which contained a connection between probabilities and results. However, the author has not done this. Furthermore, in some applications of Bayes's principle he has used two different scales in the same problem without any interpretation or justification of the procedure. Thus in the case of problems of estimation we are left with formulas based on very doubtful prior probabilities. If this were the best we could do, we should have to be content. But Fisher and Neyman have developed corresponding formulas which are independent of the prior probabilities.

The author has tackled a problem which has previously received too little attention and much is to be gained by following his treatment of the subject. Thus my criticisms should be taken simply as indicating points that need further attention. The book is indeed a contribution to the advancement of science.

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EUGENICS

Preface to Eugenics. By FREDERICK OSBORN. 312 pp. New York: Harper and Brothers, 1940. $2.75.

THE preface to eugenics is the set of principles and practices that must be adopted before "a eugenic form of society will be possible" (p. 260). This set includes: birth control, "equal opportunities for development open to all children everywhere." "Children have the right to be born to parents who will care for them properly. Children have the right to be born free of the more serious hereditary defects." The book under review is largely an elaboration of these points.

There are seven chapters. The first refers to chromosomes and genes, human variability and the need of improvement of the racial stock. The second is a keen and sound study of the hereditary and environmental factors in the psychological sphere. This is largely the work of Dr. Gladys Schwesinger. Chapters 3 and 4 deal chiefly with population and are largely quantitative; but reference is made to relative fecundity of whites and Negroes and that of various socio-economic groups. Chapter 5 deals with eugenic selection under the influence of a favorable environment and stresses the importance of birth control and especially the desirability of the reduction of births among those least responsive to the possibilities of their environment and the increase of births among parents who are most responsive. The author does not discuss the craving for children that exists among certain middle-class women like the mother of President Harding, who had eight children and stated that she wished she had had more. On the other hand, just as in Rome great prosperity resulted in reduction of fecundity among the "higher" classes, so prosperity seems to act in the United States. No subsidy would alter their attitude. Chapter 6 deals with the psychological aspects of a eugenical environment. This cites from Dr. Margaret Mead the case of two primitive peoples in one of whom the children are handled gently by the parents and become gentle; in the other the children are handled roughly and grow into hard and aggressive adults. The possibility that there is a genetic thread running through the generations that may be partly responsible for the difference is not discussed. In geese, living in flocks, the parental instinct herds the young from infancy and when they in turn become parents they herd their young. Is this merely a transmission of a tradition, or is there an hereditary factor? The author states that the ideal of equalizing educational opportunities in the United States has never been fully attained. He does not discuss the possibility that the inequality of opportunity is partly due to the inequality of the children for taking advantage of it. The author finds that the atmosphere of colleges and graduate schools is generally unfavorable to marriage. Perhaps there is a selection here such that the more marriageable are married before they get to the graduate schools. If, as the author concludes, "parents who want no more children should be helped not to have them, and par-