immediate steps for our own defense. Scientists, as scientists, can nevertheless properly urge that decisions on this and related questions shall be taken only in the light of cool rationality and a realistic assessment of long-run consequences.          ROBERT S. MULLIKEN

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# QUOTATIONS

## THE NEW YORK SESSION OF THE AMERICAN MEDICAL ASSOCIATION

IN 1917 the American Medical Association met in New York City, where in 1940 it will assemble again for its ninety-first annual session. In those days all the talk was of the war and of participation by the United States. The House of Delegates bade official farewell to Dr. Alexander Lambert, about to leave for France. The medical profession was concerned with plans for its own service. Before the war ended, some fifty thousand doctors had been intimately associated with medical military affairs. Chief among the topics before the House of Delegates was a report on social insurance—actually compulsory sickness insurance. The war ended much of that discussion; but the years passed, the crash came, the banks closed, unemployment and destitution increased, the problem of the aged was thrown into politics, the Social Security Law was developed, and again compulsory sickness insurance held the center of the stage. Notwithstanding the World War and the social problems of 1917, the scientific sections of the American Medical Association held their meetings, the Scientific Exhibit displayed some fifty contributions and over six thousand doctors registered their attendance.

Now in 1940 a new war has engulfed nearly all the world; the United States has not become involved, although much of the rest of the world seems trembling on the brink of involvement. For preparedness, base hospitals are being organized throughout the nation; but it seems unlikely that military matters will come before the House of Delegates. True, the situation in Europe is reflected in the problem of the medical refugees, but years of experience have already indicated some significant factors involved in this question.

For almost a quarter of a century the medical pro-

fession has been maintaining high standards of medical care, opposing successfully all attempts to regiment, degrade or deteriorate its services. There is no reason to believe that the House of Delegates will abandon its repeatedly declared points of view or that it will recede one iota in its ideals. Indeed, all its tendencies have been toward strengthening the mechanisms by which its principles are maintained.

As medicine comes into the 1940 session the time before adjournment of the Congress seems but brief. Such legislation in the medical field as the Congress may enact will no doubt bear the reflection of the platform of the American Medical Association. Succeeding months will see our two great political parties assembling to select their candidates and to announce their platforms. The medical profession will observe with interest the extent to which those pronouncements reflect the fundamental features which the majority of physicians are convinced must be observed if medicine is to go forward in a democratic government.

In numbers, in scientific contributions, in exhibits, in new technics for graduate education, the 1940 session will far surpass that of 1917. During the last two years the increases in membership and in fellowship have been rapid both in rate and in numbers. The Scientific Exhibit, which in 1917 was held on the balcony of the Hotel Astor, will this year demand more than an entire floor of the Grand Central Palace. And the meeting itself will ramify through a half dozen of the great hotels. Thus in the greatest city of the world, now holding the most remarkable World's Fair that has ever been constructed, will assemble what has come to be the largest and most important medical convention. The superlatives may seem grandiloquent, but only those who participate will realize how weakly they describe the greatness of the occasion.—*Journal of the American Medical Association.*

# SCIENTIFIC BOOKS

## ORTHOGONAL POLYNOMIALS

*Orthogonal polynomials.* By GABOR SZEGÖ. ix + 401 pp. Colloquium Publications, vol. 23, American Mathematical Society, New York, 1939. $6.00.

TWENTY-FIVE years ago a theory of orthogonal polynomials would have been made up of apparently heterogeneous elements, more or less forcibly dragged together from their natural context of general function theory, differential equations, integral equations, continued fractions, mathematical physics or statistics,

9 *Naturwissenschaften,* 14: 995–997, 1926.

and ranging in mathematical development from the highest degree of analytical perfection to the most naive formalism. Now a depth of critical understanding which scarcely went beyond the fundamental cases of Fourier and Legendre series has come to prevail with unifying authority over a wider range of generalization than had been even tentatively surveyed, and the diverse fields into which the applications extend derive clarification from a common body of coordinated knowledge.

To this transformation no one man has made more significant contributions than the author of the book under review. With creative mastery in particular domains he combines an unusually extensive and penetrating acquaintance with the whole background of mathematical analysis, and almost unique experience in presenting the essentials of complicated theories with the greatest possible compactness.

The result is a treatise which will be of the greatest value both to the general student and to those seeking more specialized information. A large amount of previously existing material is brought together and made readily accessible, much of it for the first time, new results are presented in their proper place, and the way is prepared for further research in various directions.

Needless to say, so extensive a domain with so many contacts can not be accurately delimited by a title in two words. Some arbitrariness in the selection of material has been inevitable. Applications, except those of a purely mathematical nature, e.g., to problems of interpolation and mechanical quadrature, have been left aside. The dominant and most significant purpose of the book from the point of view of the specialist, an exposition of the theory of asymptotic representation and equiconvergence due to the author and to S. Bernstein, has been kept constantly in view.

No less valuable to a wider group of readers, however, including those who for their own purposes are primarily interested in the applications, is the development of the fundamentals of the theory from first principles, with sustained emphasis on the "classical" orthogonal polynomials of Jacobi, Laguerre and Hermite, as well as orthogonal polynomials in a real variable with an arbitrary weight function and the author's own orthogonal polynomials on a circle or more general curve in the complex plane. Numerous facts which can not be developed in detail are presented in summary, with references to the literature.

At the end the reader's interest is directed further afield with a list of sixty "Problems and Exercises" and a sixteen-page bibliography

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## MATHEMATICAL METHODS IN ENGINEERING

*Mathematical Methods in Engineering. An Introduction to the Mathematical Treatment of Engineering Problems.* 505 pp. By THEODORE V. KARMAN and MAURICE BIOT. New York and London: McGraw-Hill Book Company, Inc., $4.00.

A TEXT-BOOK devoted to mathematical methods in engineering or in physics may be organized in two different ways. The first way is to concentrate upon a certain group of practical problems and to gather the various mathematical aids which can be used in this field. The other would be to start with a definite group of mathematical methods and to accumulate the diversified problems in which these methods might be applied. The book we are analyzing, a very remarkable contribution to the existing engineering texts, is a combination of both approaches. The first two chapters, e.g., serve as an introduction to the elementary theory of ordinary differential equations and of so-called Bessel functions. The following chapters on the other hand deal with dynamics, both generally and with a special view to the problem of small oscillations. A wide range of questions concerning modern engineering design is here discussed clearly and in detail. Mention may be made of such topics as the flight path and stability of an airplane or the vibrations and buckling of beams. Within these discussions the authors take the opportunity to introduce numerous mathematical aids which go beyond the field familiar even to engineers of advanced training. The notions of elliptic integrals and of elliptic functions are developed in connection with the motion of a pendulum; the use of matrices and certain methods for numerical solution of algebraic equations are explained in the chapter concerned with the theory of oscillations. A reader who follows the authors in studying these carefully selected special topics acquires a great deal of systematic knowledge of applied mathematics. The same is true for the later sections of the book which deal with diversified problems of structural analysis, etc. Finally, the so-called operational calculus and the method of finite differences are presented in their application to electrical and other problems. No problem requiring the solution of partial differential equations is mentioned. Although the authors do not promise it, it may be expected that they intend to treat advanced theories in a second volume of their book.

The main purpose of the authors was obviously to acquaint the reader with the art of setting up a mechanical or engineering problem. A great deal of experience in creative research work enabled them to conceive such a task. One can hardly imagine a writer more competent for this than Professor v. Karman. On the other hand it may be doubtful whether this aim can be fully attained by a single book, no matter how good it may be. The ideal reader, such as the authors may have had in mind, would have to apply a mathematical idea which he finds exposed in the book in connection with a definite practical problem, to a quite different one. This may happen in very rare cases. The average reader will extract from the book only the factual information about the problems which are explicitly dealt with. But even if used in this way the Karman-Biot book will be a great and useful help in promoting the science of theoretical engineering in this country.