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Must Express Themselves Clearly". An article in *Nature* (November 5, 1955) on "English Style in Scientific Papers", by Dr. John R. Baker cites several cases of bad usage such as "a tea containing cup" instead of "a cup containing tea." An extreme example of this construction occurred in a scientifically excellent manuscript submitted to *The Physical Review*, namely, "an external axial magnetic field partially stabilized dynamic deuterium pinch".

It may be true that some foreign constructions convey the author's intentions precisely in the original language, but they lose clarity and give a distorted meaning when translated literally into English. It is well known that jokes and especially puns can not be easily translated. An instructive example is the anecdote in which a visitor proposed some significant reforms to Emperor Franz-Joseph. He replied with "Wir werden darüber nachdenken . . . lassen." It is funny only because the verb comes at the end; it loses its surprise in translation ("We'll have some one else think about it"). Another example is the riddle which my high school teacher told his class to impress us with the pitfalls of the proper position of French adjectives. "What is the difference between a locomotive and a young girl? Une locomotive a un tender derrière, mais une jeune fille a un derrière tendre." This riddle improves in English translation, provided we now reverse the question and ask what a steam locomotive and a young lady have in common!

The book under review is written by a teacher of English, founder and president of a junior college, in collaboration with his son, a physicist. It is primarily intended for the writer of scientific books and articles. The first part of the book, entitled "Strategy", looks at writing from the point of view of the reader. It gives valuable hints to the author for establishing communication with his audience. These first 85 pages are the most valuable and original part of this book. There is also a very useful short chapter on "Troubleshooting". The remainder covers the more common subjects of grammar, punctuation, proofreading, etc.

We know that a scientist who is preparing a six-page article will not first study a 206-page book about style. He doesn't even always adhere to the one-page "instructions to authors" which is printed in most journals. However, I recommend that he acquire this book and peruse it from time to time. It will give him ideas about ways to make his technical articles more readable and understandable.

Carl Friedrich Gauss: Prince of Mathematicians. By William L. Schaaf. 168 pp. Franklin Watts, New York, 1964. \$2.95. Reviewed by R. B. Lindsay, Brown University.

Gauss was one of the greatest mathematicians who ever lived. At the same time the student of physics runs into his name so frequently that there is ample justification for considering him a great physicist as well. With the exception of the work of G. Waldo Dunnington in 1955, there has been little detailed biographical material about Gauss in English. The present book aims to combine a brief biographical sketch with a popular interpretation of Gauss' scientific work. As the author admits, it is not easy to write such a biography of a genius whose external life was on the whole not a very exciting one, and whose real existence was bound up in profound meditations of a highly abstract character.

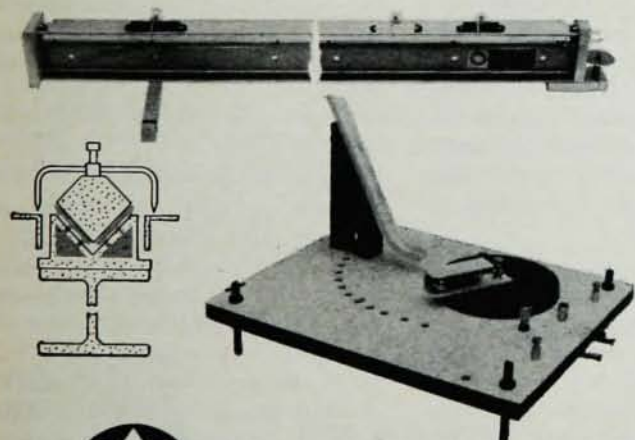
The result is a small volume in which there is not very much about Gauss but a series of attempts to explain some of the things he did, as for example, his work on the theory of numbers, real and imaginary, the fundamental theorem of algebra, celestial mechanics, geodesy, theory of errors, mapping, non-Euclidean geometry, and magnetism. On the whole, the explanations are clear and accurate and can be followed by anyone with a background in simple mathematics. But somehow the connection of these things with Gauss has not been made with sufficient emphasis to make the great mathematician stand out as a real person. Probably this would have demanded more reference to Gauss' actual writings and his correspondence.

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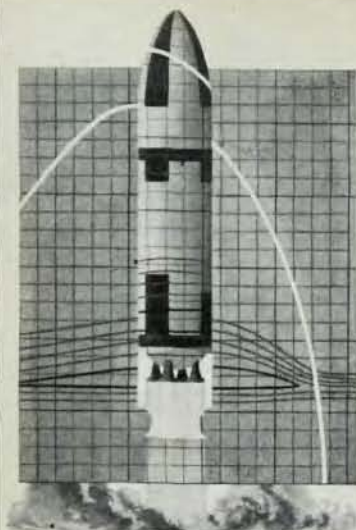
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netism, there is almost no reference to Gauss' outstanding contributions to physics. Thus the famous divergence theorem in field physics, associated with his name, is nowhere mentioned and nothing is said about his famous principle of least constraint, which constituted his attempt to provide a logical basis for mechanics comparable with the principle of D'Alembert.

The book contains a few unnecessary errors of fact. It is not correct to say that the "gauss" refers to *electromagnetic* induction; actually it is a unit for the vector **B**, or the *magnetic* induction. It is also an error to refer to Hans Christian Oersted as a German.

The author's style is in general clear and entertaining, and the book will be read with pleasure by those interested in popular aspects of the history of science.

Differential Equations of Mathematical Physics. By N. S. Koshlyakov, M. M. Smirnov, and E. B. Gliner. Transl. by Scripta Technica. Translation edited by Herbert J. Eagle. 701 pp. (North-Holland, Amsterdam) Interscience, New York, 1964. \$21.00.

Reviewed by T. Teichmann, General Atomic Division, General Dynamics Corporation.

The solution of partial differential equations, especially of linear equations of the second order, plays a central role in mathematical and theoretical physics and engineering, and there exists a correspondingly wide variety of literature. Despite the wealth of the available material, this posthumous work of Koshlyakov is a valuable contribution, particularly for purposes of teaching, since its content and manner of presentation fall between the generality, elegance and depth of Courant-Hilbert's Volume II (1963), and the almost overwhelming detail of the relevant portion of Morse and Feshbach.

Since this book covers the entire gamut of classical partial differential equations, only features which seem of particular interest will be commented on here. In the treatment of hyperbolic equations, the method of characteristics is described in a detailed and illuminating way for the problem of a vibrating string, for the longitudinal oscillations of a rod (in-

cluding the question of impact), and for the equation of telegraphy. The notion of a "generalized" solution is introduced in connection with these problems. An interesting and novel feature is a description of "functionally invariant" solutions for hyperbolic equations, which concept is related to that of "self-similar" solutions.

The section on elliptic equations contains a detailed and extended discussion of the integral theorems of Gauss, Green, et al, the general properties of Dirichlet and Neumann problems, and many applications of spherical harmonics to hydrodynamic and acoustic problems.

There is a lengthy section on the application (and applicability) of integral transforms to partial differential equations. Maxwell's equations are discussed at length, with special reference to radiation and propagation problems. There is a concise but illuminating description of viscous motion (including the notion of Reynold's number), and the book ends with a summary of the properties of generalized functions, and an indication of their application to relevant problems.

The text is full of examples, elaborate enough to be interesting, but not so complicated as to be exhausting. The same seems to be true of the many examples left for the reader, generally with hints for their solution. There is unfortunately no index, though the table of contents is quite exhaustive.

Hamiltonian Dynamics. By C. W. Kilmister. 146 pp. Wiley, New York, 1964. \$4.75.

Reviewed by D. J. Montgomery, Michigan State University.

Mathematical physics should of course be called physical mathematics, for there is often precious little physics in it. Dr. Kilmister is reader in mathematics at King's College, London, and the mathematical-physics series in which his book appears is edited by Dr. G. Stephenson of the Department of Mathematics at Imperial College, London. Correctly we surmise that in *Hamiltonian Dynamics* the physics is pushed into the background, and that we had better think twice be-