

Holt Physics Chapter 14 Refraction Test A

First-ever comprehensive introduction to the major new subject of quantum computing and quantum information.

Since it was first published in 1995, Photonic Crystals has remained the definitive text for both undergraduates and researchers on photonic band-gap materials and their use in controlling the propagation of light. This newly expanded and revised edition covers the latest developments in the field, providing the most up-to-date, concise, and comprehensive book available on these novel materials and their applications. Starting from Maxwell's equations and Fourier analysis, the authors develop the theoretical tools of photonics using principles of linear algebra and symmetry, emphasizing analogies with traditional solid-state physics and quantum theory. They then investigate the unique phenomena that take place within photonic crystals at defect sites and surfaces, from one to three dimensions. This new edition includes entirely new chapters describing important hybrid structures that use band gaps or periodicity only in some directions: periodic waveguides, photonic-crystal slabs, and photonic-crystal fibers. The authors demonstrate how the capabilities of photonic crystals to localize light can be put to work in devices such as filters and splitters. A new appendix provides

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an overview of computational methods for electromagnetism. Existing chapters have been considerably updated and expanded to include many new three-dimensional photonic crystals, an extensive tutorial on device design using temporal coupled-mode theory, discussions of diffraction and refraction at crystal interfaces, and more. Richly illustrated and accessibly written, *Photonic Crystals* is an indispensable resource for students and researchers. Extensively revised and expanded Features improved graphics throughout Includes new chapters on photonic-crystal fibers and combined index-and band-gap-guiding Provides an introduction to coupled-mode theory as a powerful tool for device design Covers many new topics, including omnidirectional reflection, anomalous refraction and diffraction, computational photonics, and much more.

The bestselling author returns with his biggest book yet in which he teaches us the secret to living a happier life: get rid of as many expectations as possible—of ourselves, our future, our relationships, our career and our family. Expectations are the secret software, running on the hardware of our minds, controlling our emotions, decisions, and actions. How? Think about your life. How much of the sadness you feel derives from what you think should have happened—than with what actually happened? Think about your career. How much of the discontent you feel comes from your belief about where you'd be at this point—than with the

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progress you've actually made? Think about your relationships. How much of your dissatisfaction with friends, family, significant others, or spouses has to do with your unspoken presumptions—than with the people themselves? Having so many expectations is distorting your perspective, decreasing your happiness and disrupting your joy. You can live a life of true freedom, greater peace and less stress: release as many expectations as possible. This, DeVon Franklin argues, is the secret to a better life now. In a culture obsessed with more, *Live Free* is a bold counterintuitive book that can start a cultural revolution, Franklin contends. Everyone struggles with unnecessary expectations. But once you learn to let go of them, you can set the stage for the life you've always wanted.

First released in the Spring of 1999, *How People Learn* has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula,

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classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. *How People Learn* examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.

University Physics is designed for the two- or three-semester calculus-based physics course. The text has been developed to meet the scope and sequence of most university physics courses and provides a foundation for a career in mathematics, science, or engineering. The book provides an important

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opportunity for students to learn the core concepts of physics and understand how those concepts apply to their lives and to the world around them. Due to the comprehensive nature of the material, we are offering the book in three volumes for flexibility and efficiency. Coverage and Scope Our University Physics textbook adheres to the scope and sequence of most two- and three-semester physics courses nationwide. We have worked to make physics interesting and accessible to students while maintaining the mathematical rigor inherent in the subject. With this objective in mind, the content of this textbook has been developed and arranged to provide a logical progression from fundamental to more advanced concepts, building upon what students have already learned and emphasizing connections between topics and between theory and applications. The goal of each section is to enable students not just to recognize concepts, but to work with them in ways that will be useful in later courses and future careers. The organization and pedagogical features were developed and vetted with feedback from science educators dedicated to the project.

VOLUME III Unit 1: Optics
Chapter 1: The Nature of Light Chapter 2: Geometric Optics and Image Formation Chapter 3: Interference Chapter 4: Diffraction Unit 2: Modern Physics
Chapter 5: Relativity Chapter 6: Photons and Matter Waves Chapter 7: Quantum Mechanics Chapter 8: Atomic Structure Chapter 9: Condensed Matter Physics

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Chapter 10: Nuclear Physics Chapter 11: Particle Physics and Cosmology
Schlieren and shadowgraph techniques are basic and valuable tools in various scientific and engineering disciplines. They allow us to see the invisible: the optical inhomogeneities in transparent media like air, water, and glass that otherwise cause only ghostly distortions of our normal vision. These techniques are discussed briefly in many books and papers, but there is no up-to-date complete treatment of the subject before now. The book is intended as a practical guide for those who want to use these methods, as well as a resource for a broad range of disciplines where scientific visualization is important. The colorful 400-year history of these methods is covered in an extensive introductory chapter accessible to all readers.

An algebra-based physics text designed for the first year, non-calculus college course. Although it covers the traditional topics in the traditional order, this book is very different from its often over-inflated competitors. This textbook is a groundbreaking iconoclast in this market, answering a clear demand from physics instructors for a clearer, shorter, more readable and less expensive introductory textbook.

It is quite satisfying for an author to learn that his brainchild has been favorably accepted by students as well as by professors and thus seems to serve some useful purpose. This

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horizontally integrated text on the electronic properties of metals, alloys, semiconductors, insulators, ceramics, and polymeric materials has been adopted by many universities in the United States as well as abroad, probably because of the relative ease with which the material can be understood. The book has now gone through several reprinting cycles (among them a few pirate prints in Asian countries). I am grateful to all readers for their acceptance and for the many encouraging comments which have been received. I have thought very carefully about possible changes for the second edition. There is, of course, always room for improvement. Thus, some rewording, deletions, and additions have been made here and there. I withstood, however, the temptation to expand considerably the book by adding completely new subjects. Nevertheless, a few pages on recent developments needed to be inserted. Among them are, naturally, the discussion of ceramic (high-temperature) superconductors, and certain elements of the rapidly expanding field of optoelectronics. Further, I felt that the readers might be interested in learning some more practical applications which result from the physical concepts which have been treated here.

Colour and the Optical Properties of Materials carefully introduces the science behind the subject, along with many modern and cutting-edge applications, chosen to appeal to today's students. For science students, it provides a broad introduction to the subject and the many applications of colour. To more applied students, such as engineering and arts students, it provides the essential scientific background to colour and the many applications. New to this Edition: The chapter framework of the first edition will be retained, with each chapter being substantially rewritten and some material would be relocated. Some chapters will be rewritten in a clearer fashion, e.g. There have been no significant advances in the understanding of

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rainbows recently, but the text could be clarified and improved. Colour has been an important attribute of many nano-particle containing systems, such as quantum dots. This aspect will be included, e.g. the colour of gold ruby glass, described in Chapter 5 as part of scattering phenomena now is better treated in terms of gold nanoparticles and surface plasmons. This would probably be transferred to Chapter 10 and considered in tandem with the colour of metals such as copper, silver and gold. A similar state of affairs applies to silver nanoparticles and polychromic glass. Some chapters will include extensive new material, e.g. Chapter 8, colours due to molecular processes [organic LEDs etc], and Chapter 12, Displays, [touch screen technologies]. For all chapters it would be intended to take into account the current scientific literature up to the time of submission – say up to the end of 2009. The end of chapter Further Reading sections would reflect this up-to-date overview. The end of chapter problems will be strengthened and expanded.

From September 24 through 30, 1992 the Workshop on "Waves and Particles in Light and Matter" was held in the Italian city of Trani in celebration of the centenary of Louis de Broglie's birth. As is well known, the relationship between quantum theory and objective reality was one of the main threads running through the researches of this French physicist. It was therefore in a fitting tribute to him on his 90th birthday that ten years ago an international conference on the same subject was convened in Perugia. On that occasion, physicists from all over the world interested in the problematics of wave-particle duality engaged in thoughtful debates (the proceedings of which were subsequently published) on recent theoretical and experimental developments in our understanding of the foundations of quantum mechanics. This time around, about 120 scientists, coming from 5 continents, in the warm and pleasant atmosphere

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of Trani's Colonna Conference Center focussed their discussions on recent results concerned with the EPR para dox, matter-interferometry, reality of de Broglie's waves, photon detection, macroscopic quantum coherence, alternative theories to usual quantum mechanics, special relativity, state reduction, and other related topics. The workshop was organized in plenary sessions, round tables, and poster sessions, and the present volume collects most-but not all-of the presented papers. A number of acknowledgements are due. We thank, first of all, the contributors, without whose constant dedication this volume could not have been published. The College Physics for AP(R) Courses text is designed to engage students in their exploration of physics and help them apply these concepts to the Advanced Placement(R) test. This book is Learning List-approved for AP(R) Physics courses. The text and images in this book are grayscale.

Excerpt from Lecture Notes on Light If the importance of having good notes is once accepted, the question then arises as to the form that they should take. Should they be written or printed notes? For a good many years notes on Physics were dictated to the boys at Gresham's School. It was found, however, that this took up a considerable amount of valuable time, which could be saved by having the notes printed and copies supplied to the boys. The result has been a gain of fifty per cent. In the amount of ground covered. At the same time it has been found that the subject matter has been acquired by the boys just as well as through the dictated notes, perhaps even better. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections

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present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Praise for *How Learning Works* "How Learning Works is the perfect title for this excellent book. Drawing upon new research in psychology, education, and cognitive science, the authors have demystified a complex topic into clear explanations of seven powerful learning principles. Full of great ideas and practical suggestions, all based on solid research evidence, this book is essential reading for instructors at all levels who wish to improve their students' learning."

—Barbara Gross Davis, assistant vice chancellor for educational development, University of California, Berkeley, and author, *Tools for Teaching* "This book is a must-read for every instructor, new or experienced. Although I have been teaching for almost thirty years, as I read this book I found myself resonating with many of its ideas, and I discovered new ways of thinking about teaching." —Eugenia T. Paulus, professor of chemistry, North Hennepin Community College, and 2008 U.S. Community Colleges Professor of the Year from The Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education "Thank you Carnegie Mellon for making accessible what has previously been inaccessible to those of us who are not learning scientists. Your focus on the essence of learning combined with concrete examples of the daily challenges of teaching and clear tactical strategies for faculty to consider is a welcome work. I will recommend this book to all my colleagues." —Catherine M. Casserly, senior partner, The Carnegie Foundation for the Advancement of Teaching "As you read about each of the seven basic learning principles in

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this book, you will find advice that is grounded in learning theory, based on research evidence, relevant to college teaching, and easy to understand. The authors have extensive knowledge and experience in applying the science of learning to college teaching, and they graciously share it with you in this organized and readable book." —From the Foreword by Richard E. Mayer, professor of psychology, University of California, Santa Barbara; coauthor, *e-Learning and the Science of Instruction*; and author, *Multimedia Learning*

For the intermediate-level course, the Fifth Edition of this widely used text takes modern physics textbooks to a higher level. With a flexible approach to accommodate the various ways of teaching the course (both one- and two-term tracks are easily covered), the authors recognize the audience and its need for updated coverage, mathematical rigor, and features to build and support student understanding. Continued are the superb explanatory style, the up-to-date topical coverage, and the Web enhancements that gained earlier editions worldwide recognition. Enhancements include a streamlined approach to nuclear physics, thoroughly revised and updated coverage on particle physics and astrophysics, and a review of the essential Classical Concepts important to students studying Modern Physics.

Eclipses have long been seen as important celestial phenomena, whether as omens affecting the future of kingdoms, or as useful astronomical events to help in deriving essential parameters for theories of the motion of the moon and sun. This is the first book to collect together all presently known records of timed eclipse observations and predictions from antiquity to the time of the invention of the telescope. In addition to cataloguing and assessing the accuracy of the various records, which come from

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regions as diverse as Ancient Mesopotamia, China, and Europe, the sources in which they are found are described in detail. Related questions such as what type of clocks were used to time the observations, how the eclipse predictions were made, and how these prediction schemes were derived from the available observations are also considered. The results of this investigation have important consequences for how we understand the relationship between observation and theory in early science and the role of astronomy in early cultures, and will be of interest to historians of science, astronomers, and ancient and medieval historians.

This open access book, edited and authored by a team of world-leading researchers, provides a broad overview of advanced photonic methods for nanoscale visualization, as well as describing a range of fascinating in-depth studies. Introductory chapters cover the most relevant physics and basic methods that young researchers need to master in order to work effectively in the field of nanoscale photonic imaging, from physical first principles, to instrumentation, to mathematical foundations of imaging and data analysis. Subsequent chapters demonstrate how these cutting edge methods are applied to a variety of systems, including complex fluids and biomolecular systems, for visualizing their structure and dynamics, in space and on timescales extending over many orders of magnitude down to the femtosecond range. Progress in nanoscale photonic imaging in Göttingen has been the sum total of more than a decade of work by a wide range of scientists and mathematicians across disciplines, working together in a

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vibrant collaboration of a kind rarely matched. This volume presents the highlights of their research achievements and serves as a record of the unique and remarkable constellation of contributors, as well as looking ahead at the future prospects in this field. It will serve not only as a useful reference for experienced researchers but also as a valuable point of entry for newcomers.

This book features reviews by leading experts on the methods and applications of modern forms of microscopy. The recent awards of Nobel Prizes awarded for super-resolution optical microscopy and cryo-electron microscopy have demonstrated the rich scientific opportunities for research in novel microscopies. Earlier Nobel Prizes for electron microscopy (the instrument itself and applications to biology), scanning probe microscopy and holography are a reminder of the central role of microscopy in modern science, from the study of nanostructures in materials science, physics and chemistry to structural biology. Separate chapters are devoted to confocal, fluorescent and related novel optical microscopies, coherent diffractive imaging, scanning probe microscopy, transmission electron microscopy in all its modes from aberration corrected and analytical to in-situ and time-resolved, low energy electron microscopy, photoelectron microscopy, cryo-electron microscopy in biology, and also ion microscopy. In addition to serving as an essential reference for researchers and teachers in the fields such as materials science, condensed matter physics, solid-state chemistry, structural biology and the molecular sciences generally, the Springer Handbook of Microscopy is a

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unified, coherent and pedagogically attractive text for advanced students who need an authoritative yet accessible guide to the science and practice of microscopy. This book presents a basic introduction to quantum mechanics. Depending on the choice of topics, it can be used for a one-semester or two-semester course. An attempt has been made to anticipate the conceptual problems students encounter when they first study quantum mechanics. Wherever possible, examples are given to illustrate the underlying physics associated with the mathematical equations of quantum mechanics. To this end, connections are made with corresponding phenomena in classical mechanics and electromagnetism. The problems at the end of each chapter are intended to help students master the course material and to explore more advanced topics. Many calculations exploit the extraordinary capabilities of computer programs such as Mathematica, MatLab, and Maple. Students are urged to use these programs, just as they had been urged to use calculators in the past. The treatment of various topics is rather complete, in that most steps in derivations are included. Several of the chapters go beyond what is traditionally covered in an introductory course. The goal of the presentation is to provide the students with a solid background in quantum mechanics.

A complete basic undergraduate course in modern optics for students in physics, technology, and engineering. The first half deals with classical physical optics; the second, quantum nature of light. Solutions.

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The physicist and humanitarian took his place beside the great teachers with the publication of *Relativity: The Special and General Theory*, Einstein's own popular translation of the physics that shaped our "truths" of space and time.

Designed to be motivating to the student, this title includes features that are suitable for individual learning. It covers the AS-Level and core topics of almost all A2 specifications.

This book covers interaction between wind and ocean waves, for ocean wave modellers, physicists, applied mathematicians, engineers.

One of the field's most respected introductory texts, *Modern Physics* provides a deep exploration of fundamental theory and experimentation. Appropriate for second-year undergraduate science and engineering students, this esteemed text presents a comprehensive introduction to the concepts and methods that form the basis of modern physics, including examinations of relativity, quantum physics, statistical physics, nuclear physics, high energy physics, astrophysics, and cosmology. A balanced pedagogical approach examines major concepts first from a historical perspective, then through a modern lens using relevant experimental evidence and discussion of recent developments in the field. The emphasis on the interrelationship of principles and methods provides continuity, creating an accessible "storyline" for students to follow. Extensive pedagogical tools aid in comprehension, encouraging students to think critically and strengthen their ability to apply conceptual knowledge to practical

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applications. Numerous exercises and worked examples reinforce fundamental principles.

Dr. Khan's classic textbook on radiation oncology physics is now in its thoroughly revised and updated Fourth Edition. It provides the entire radiation therapy team—radiation oncologists, medical physicists, dosimetrists, and radiation therapists—with a thorough understanding of the physics and practical clinical applications of advanced radiation therapy technologies, including 3D-CRT, stereotactic radiotherapy, HDR, IMRT, IGRT, and proton beam therapy. These technologies are discussed along with the physical concepts underlying treatment planning, treatment delivery, and dosimetry. This Fourth Edition includes brand-new chapters on image-guided radiation therapy (IGRT) and proton beam therapy. Other chapters have been revised to incorporate the most recent developments in the field. This edition also features more than 100 full-color illustrations throughout. A companion Website will offer the fully searchable text and an image bank.

This third edition covers topics in physics as they apply to the life sciences, specifically medicine, physiology, nursing and other applied health fields. It includes many figures, examples and illustrative problems and appendices which provide convenient access to the most important concepts of mechanics, electricity, and optics.

Holt Physics Section Reviews Holt Rinehart & Winston Holt McDougal Physics Holt McDougal Physics Advanced Physics for You Nelson Thornes

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Thomas Pynchon is up to his usual business. Characters stop what they're doing to sing what are for the most part stupid songs. Strange sexual practices take place. Obscure languages are spoken, not always idiomatically. Contrary-to-fact occurrences occur. Maybe it's not the world, but with a minor adjustment or two it's what the world might be.

Drop a pebble in a pond and the results are predictable: circular waves flow from the point of impact. Hit a point on a crystalline solid, however, and the expanding waves are highly nonspherical; the elasticity of a crystal is anisotropic. This book provides a fresh look at the vibrational properties of crystalline solids, elucidated by new imaging techniques. From the megahertz vibrations of ultrasound to the near-terahertz vibrations associated with heat, the underlying elastic anisotropy of the crystal asserts itself. Phonons are elementary vibrations that affect many properties of solids--thermal, electrical, and magnetic. This text covers the basic theory and experimental observations of phonon propagation in solids. Phonon imaging techniques provide physical insights into such topics as phonon focusing, lattice dynamics, and ultrasound propagation. Scattering of phonons from interfaces, superlattices, defects, and electrons are treated in detail. The book includes many striking and original illustrations.

to Atomic and Nuclear Physics Aerial view of the National Accelerator Laboratory, Batavia, Illinois. (Photograph courtesy of NAL.) Introduction to Atomic and Nuclear Physics HENRY SEMAT Professor Emeritus The City College of the City University of New York JOHN R.

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ALBRIGHT The Florida State University FIFTH EDITION LONDON NEW YORK CHAPMAN AND HALL First edition 1939 Fifth edition, first published in the U.S.A. by Holt, Rinehart and Winston, Inc. Fifth edition first published in Great Britain 1973 by Chapman and Hall Ltd 11 New Fetter Lane, London EC4P 4EE Reprinted as a paperback 1978 Reprinted 1979, 1983, 1985 © 1939, 1946, 1954, 1962 by Henry Semat © 1972 by Holt, Rinehart and Winston, Inc. Fletcher & Son Ltd, Norwich ISBN-13: 978-0-412-15670-0 e-ISBN-13: 978-1-4615-9701-8 DOI: 10.1007/978-1-4615-9701-8 All rights reserved. No part of this book may be reprinted, or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage and retrieval system, without permission in writing from the Publisher.

Sound-Power Flow: A practitioner's handbook for sound intensity is a guide for practitioners and research scientists in different areas of acoustical science. There are three fundamental quantities in acoustics: sound pressure, sound particle velocity, and sound intensity. This book is about sound intensity and demonstrates the advantages and uses of acoustical sensing compared with other forms of sensing. It describes applications such as: measuring total sound power; directional hearing of humans and mammals; echolocation; measuring sound-power flow in ducts; and uses of non-contact, focused, high-frequency, pulse-echo ultrasonic probes. This book presents computational approaches using standard mathematics, and relates these to the measurement of sound-power flow in air and water. It also uses linear units rather than logarithmic units – this making computation in acoustics simpler and more accessible to advanced mathematics and computing. The book is based on work by the author and his associates at General Motors, the University of Mississippi, and Sonometrics.

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Bell's Theorem and its associated implications for the nature of the physical world remain topics of great interest. For this reason many meetings have been recently held on the interpretation of quantum theory and the implications of Bell's Theorem. Generally these meetings have been held primarily for quantum physicists and philosophers of science who have been or are actively working on the topic. Nevertheless, other philosophers of science, mathematicians, engineers as well as members of the general public have increasingly taken interest in Bell's Theorem and its implications. The Fall Workshop held at George Mason University on October 21 and 22, 1988 and titled "Bell's Theorem, Quantum Theory and Conceptions of the Universe" was of a more general scope. Not only it attracted experts in the field, it also covered other topics such as the implications of quantum non-locality for the nature of consciousness, cosmology, the anthropic principle, etc. topics usually not covered in previous meetings of this kind. The meeting was attended by more than one hundred ten specialists and other interested people from all over the world. The purpose of the meeting was not to provide a definitive answer to the general questions raised by Bell's Theorem. It is likely that the debate will go on for quite a long time. Rather, it was meant to contribute to the important dialogue between different disciplines.

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