

Henri Pirenne
Economic and Social
History of
Medieval
Europe



HB-14 Harvest Books \$1.25

Economic And Social History Of Medieval Europe

Henri Pirenne



Economic And Social History Of Medieval Europe:

Economic and Social History of Medieval Europe Henri Pirenne, 1956 An account of the historical evolution of Western Europe from the end of the Roman Empire to the middle of the 15th century **Economic and Social History of Medieval**

Europe Henri Pirenne, 1953 *Economic and Social History of Medieval Europe* Jean Henri Otto Lucien Marie Pirenne, 1936

A Social and Economic History of Medieval Europe Gerald A. Hodgett, 2013-11-05 This excellent and concise summary of the social and economic history of Europe in the Middle Ages examines the changing patterns and developments in agriculture commerce trade industry and transport that took place during the millennium between the fall of the Roman Empire and the discovery of the New World After outlining the trends in demography prices rent and wages and in the patterns of settlement and cultivation the author also summarizes the basic research done in the last twenty five years in many aspects of the social and economic history of medieval Europe citing French German and Italian works as well as English Significantly this study surveys the present state of discussion on a number of on unresolved issues and controversies and in some areas suggests common sense answers Some of the problems of economic growth or the lack of it are looked at in the light of current theories in sociology and economic thought This classic text first published in 1972 makes a useful and interesting general introduction for students of medieval and economic history **Economic and Social History of**

Medieval Europe Henri Pirenne (Historien, Belgique), 1937 An Economic and Social History of Later Medieval Europe, 1000-1500 Steven A. Epstein, 2009-04-27 This book examines the most important themes in European social and economic history from the beginning of growth around the year 1000 to the first wave of global exchange in the 1490s These five hundred years witnessed the rise of economic systems such as capitalism and the social theories that would have a profound influence on the rest of the world over the next five centuries The basic story the human search for food clothing and shelter in a world of violence and scarcity is a familiar one and the work and daily routines of ordinary women and men are the focus of this volume Surveying the full extent of Europe from east to west and north to south Steven Epstein illuminates family life economic and social thought war technologies and other major themes while giving equal attention to developments in trade crafts and agriculture The great waves of famine and then plague in the fourteenth century provide the centerpiece of a book that seeks to explain the causes of Europe's uneven prosperity and its response to catastrophic levels of death Epstein also sets social and economic developments within the context of the Christian culture and values that were common across Europe and that were in constant tension with Muslims Jews and dissidents within its boundaries and the great Islamic and Tartar states on its frontier **ECONOMIC AND SOCIAL HISTORY OF MEDIEVAL EUROPE. BY HENRI PIRENNE.**

TRANSL. FROM THE FRENCH BY I.E. CLEGG. Henri Pirenne, 1936 Economic and Social History of the Middle Ages James Westfall Thompson, 1928 **A Social and Economic History of Medieval Europe** Gerald Augustus John

Hodgett, 1976 **A Social and Economic History of Medieval Europe** Gerald Augustus John Hodgett, 1972 *An*

Economic History of Medieval Europe Norman John Greville Pounds, 2014-06-06 A clear and readable account of the development of the European economy and its infrastructure from the second century to 1500 Professor Pounds provides a balanced view of the many controversies within the subject and he has a particular gift for bringing a human dimension to its technicalities He deals with continental Europe as a whole including an unusually rich treatment of Eastern Europe For this welcome new edition the first in twenty years text and bibliography have been reworked and updated throughout and the book redesigned and reset

A History of Business in Medieval Europe, 1200-1550 Edwin S. Hunt, James M. Murray, 1999-03-28 This book demolishes the widely held view that the phrase medieval business is an oxymoron The authors review the entire range of business in medieval western Europe probing its Roman and Christian heritage to discover the economic and political forces that shaped the organization of agriculture manufacturing construction mining transportation and marketing Businessmen s responses to the devastating plagues famines and warfare that beset Europe in the late Middle Ages are equally well covered Medieval businessmen s remarkable success in coping with this hostile new environment was a harvest of adversity that prepared the way for the economic expansion of the sixteenth century Two main themes run through this book First the force and direction of business development in this period stemmed primarily from the demands of the elite Second the lasting legacy of medieval businessmen was less their skillful adaptations of imported inventions than their brilliant innovations in business organization

Liberty, Science and Wealth Ralph L. Bayrer, 2021-11-29 Ralph Bayrer s new book *Free People Free Markets Their Evolutionary Origins* is a timely reaffirmation of freedom s central role in the creation of American prosperity and the most celebrated advances of western civilization Relying on the thorough scholarship and clarity of argument Bayrer makes the compelling case that mankind s progress in the last millennium rests on a narrow foundation of freedom a lesson people forget at their peril This book is a compelling new perspective on economic and political history which can be expected to make a contribution to both academic and popular understanding But its most important contribution will be in helping guide current governmental decisions away from avoidable errors

Phillip Scribner Associate Professor of Philosophy Emeritus American University [The Routledge History of Medieval Christianity](#) R. N. Swanson, 2015-04-10 The Routledge History of Medieval Christianity explores the role of Christianity in European society from the middle of the eleventh century until the dawning of the Reformation Arranged in four thematic sections and comprising 23 originally commissioned chapters plus introductory overviews to each part by the editor this book provides an authoritative survey of a vital element of medieval history Comprehensive and cohesive the volume provides a holistic view of Christianity in medieval Europe examining not only the church itself but also its role in influence on and tensions with contemporary society Chapters therefore range from examinations of structures theology and devotional practices within the church to topics such as gender violence and holy warfare the economy morality culture and many more besides demonstrating the pervasiveness and importance of the church and Christianity in the medieval world Despite the

transition into an increasingly post Christian age the historic role of Christianity in the development of Europe remains essential to the understanding of European history particularly in the medieval period This collection will be essential reading for students and scholars of medieval studies across a broad range of disciplines

Women and Wealth in Late Medieval Europe T. Earenfight, 2010-03-15 The twelve essays in *Women and Wealth in Late Medieval Europe* re-examine the vexing issue of women money wealth and power from distinctive perspectives literature history architectural history using new archival sources The contributors examine how money and changing attitudes toward wealth affected power relations between women and men of all ranks especially the patriarchal social forces that constrained the range of women's economic choices Employing theories on gender culture and power this volume reveals wealth as both the motive force in gender relations and a precise indicator of other more subtle forms of power and influence mediated by gender

The History of Medieval Europe Lynn Thorndike, 2023-11-08 Lynn Thorndike's *The History of Medieval Europe* offers a comprehensive examination of the social political and cultural dynamics that defined the European medieval period from roughly the 5th to the 15th century Thorndike's scholarly yet accessible prose effectively integrates a range of historical sources making it invaluable for both academic discourse and casual readers The book is marked by its systematic approach meticulously categorizing events and movements while weaving in the nuanced texture of medieval life thereby inviting readers to grasp the complexities of this transitional era Lynn Thorndike a prominent historian and scholar is noted for his deep engagement with medieval studies and the history of science His extensive academic background which includes a focus on the intersection of religion philosophy and medieval science informs the rich tapestry found within this work Thorndike's passion for illuminating the past is evident driven by a desire to bridge historical understanding with contemporary relevance offering readers a new lens through which to view their world I highly recommend *The History of Medieval Europe* for anyone seeking to deepen their understanding of this vital period Whether you are a student educator or simply a history enthusiast Thorndike's insightful analysis and engaging narrative will provide you with a profound perspective on the foundations of modern Europe

Black Marxism, Revised and Updated Third Edition Cedric J. Robinson, 2020-12-16 In this ambitious work first published in 1983 Cedric Robinson demonstrates that efforts to understand Black people's history of resistance solely through the prism of Marxist theory are incomplete and inaccurate Marxist analyses tend to presuppose European models of history and experience that downplay the significance of Black people and Black communities as agents of change and resistance Black radicalism Robinson argues must be linked to the traditions of Africa and the unique experiences of Blacks on Western continents and any analyses of African American history need to acknowledge this To illustrate his argument Robinson traces the emergence of Marxist ideology in Europe the resistance by Blacks in historically oppressive environments and the influence of both of these traditions on such important twentieth century Black radical thinkers as W E B Du Bois C L R James and Richard Wright This revised and updated third edition

includes a new preface by Tiffany Willoughby Herard and a new foreword by Robin D G Kelley **Free People, Free Markets** Ralph L. Bayrer, 2010 Relying on thorough scholarship and clarity of argument Bayrer makes the compelling case that mankind's progress in the last millennium rests on a narrow foundation of freedom a lesson people forget at their peril John McCain U S senator **Introduction to Medieval Europe 300-1500** Wim Blockmans, Peter Hoppenbrouwers, 2017-11-03 Introduction to Medieval Europe 300 1500 provides a comprehensive survey of this complex and varied formative period of European history covering themes as diverse as barbarian migrations the impact of Christianisation the formation of nations and states the emergence of an expansionist commercial economy the growth of cities the Crusades the effects of plague and the intellectual and cultural life of the Middle Ages The book explores the driving forces behind the formation of medieval society and the directions in which it developed and changed In doing this the authors cover a wide geographic expanse including Western interactions with the Byzantine Empire and the Islamic World This third edition contains a wealth of new features that help to bring this fascinating era to life including In the book A number of new maps and images to further understanding of the period Clear signposting and extended discussions of key topics such as feudalism and gender Expanded geographic coverage into Eastern Europe and the Middle East On the companion website An updated comparative and interactive timeline highlighting surprising synchronicities in medieval history and annotated links to useful websites A list of movies television series and novels related to the Middle Ages accompanied by introductions and commentaries Assignable discussion questions and the maps plates figures and tables from the book available to download and use in the classroom Clear and stimulating the third edition of Introduction to Medieval Europe is the ideal companion to studying Europe in the Middle Ages at undergraduate level **Chivalry and Violence in Medieval Europe** Richard W. Kaeuper, 2001 Includes evidence from chivalric literature chivalric mythology knights and hermits the Church and governing power war and violence prowess honor piety status war and tournament conduct of war looting and destruction loyalty nobility largesse formal manners male bonding sexual violence Song of Aspremont Crowning of Louis Raoul de Cambrai The Quest of the Holy Grail The Death of King Arthur Robert the Devil Sir Gowther The Romance of the Wings The Book of the Order of Chivalry L Histoire de Guillaume le Marechal Livre de chevalerie Morte Darthur etc

Immerse yourself in heartwarming tales of love and emotion with is touching creation, **Economic And Social History Of Medieval Europe** . This emotionally charged ebook, available for download in a PDF format (Download in PDF: *), is a celebration of love in all its forms. Download now and let the warmth of these stories envelop your heart.

<http://www.pet-memorial-markers.com/public/Resources/HomePages/Fm%20An%20Introduction%20To%20Frequency%20Modulation%201st%20Edition.pdf>

Table of Contents Economic And Social History Of Medieval Europe

1. Understanding the eBook Economic And Social History Of Medieval Europe
 - The Rise of Digital Reading Economic And Social History Of Medieval Europe
 - Advantages of eBooks Over Traditional Books
2. Identifying Economic And Social History Of Medieval Europe
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Economic And Social History Of Medieval Europe
 - User-Friendly Interface
4. Exploring eBook Recommendations from Economic And Social History Of Medieval Europe
 - Personalized Recommendations
 - Economic And Social History Of Medieval Europe User Reviews and Ratings
 - Economic And Social History Of Medieval Europe and Bestseller Lists
5. Accessing Economic And Social History Of Medieval Europe Free and Paid eBooks
 - Economic And Social History Of Medieval Europe Public Domain eBooks
 - Economic And Social History Of Medieval Europe eBook Subscription Services
 - Economic And Social History Of Medieval Europe Budget-Friendly Options

6. Navigating Economic And Social History Of Medieval Europe eBook Formats
 - ePub, PDF, MOBI, and More
 - Economic And Social History Of Medieval Europe Compatibility with Devices
 - Economic And Social History Of Medieval Europe Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Economic And Social History Of Medieval Europe
 - Highlighting and Note-Taking Economic And Social History Of Medieval Europe
 - Interactive Elements Economic And Social History Of Medieval Europe
8. Staying Engaged with Economic And Social History Of Medieval Europe
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Economic And Social History Of Medieval Europe
9. Balancing eBooks and Physical Books Economic And Social History Of Medieval Europe
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Economic And Social History Of Medieval Europe
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Economic And Social History Of Medieval Europe
 - Setting Reading Goals Economic And Social History Of Medieval Europe
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Economic And Social History Of Medieval Europe
 - Fact-Checking eBook Content of Economic And Social History Of Medieval Europe
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements

- Interactive and Gamified eBooks

Economic And Social History Of Medieval Europe Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Economic And Social History Of Medieval Europe free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Economic And Social History Of Medieval Europe free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that offer free PDF downloads on a specific topic. While downloading Economic And Social History Of Medieval Europe free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Economic And Social History Of Medieval Europe. In conclusion, the internet offers numerous platforms and websites that allow users

to download free PDF files legally. Whether its classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Economic And Social History Of Medieval Europe any PDF files. With these platforms, the world of PDF downloads is just a click away.

FAQs About Economic And Social History Of Medieval Europe Books

What is a Economic And Social History Of Medieval Europe PDF? A PDF (Portable Document Format) is a file format developed by Adobe that preserves the layout and formatting of a document, regardless of the software, hardware, or operating system used to view or print it. **How do I create a Economic And Social History Of Medieval Europe PDF?** There are several ways to create a PDF: Use software like Adobe Acrobat, Microsoft Word, or Google Docs, which often have built-in PDF creation tools. Print to PDF: Many applications and operating systems have a "Print to PDF" option that allows you to save a document as a PDF file instead of printing it on paper. Online converters: There are various online tools that can convert different file types to PDF. **How do I edit a Economic And Social History Of Medieval Europe PDF?** Editing a PDF can be done with software like Adobe Acrobat, which allows direct editing of text, images, and other elements within the PDF. Some free tools, like PDFescape or Smallpdf, also offer basic editing capabilities. **How do I convert a Economic And Social History Of Medieval Europe PDF to another file format?** There are multiple ways to convert a PDF to another format: Use online converters like Smallpdf, Zamzar, or Adobe Acrobats export feature to convert PDFs to formats like Word, Excel, JPEG, etc. Software like Adobe Acrobat, Microsoft Word, or other PDF editors may have options to export or save PDFs in different formats. **How do I password-protect a Economic And Social History Of Medieval Europe PDF?** Most PDF editing software allows you to add password protection. In Adobe Acrobat, for instance, you can go to "File" -> "Properties" -> "Security" to set a password to restrict access or editing capabilities. Are there any free alternatives to Adobe Acrobat for working with PDFs? Yes, there are many free alternatives for working with PDFs, such as: LibreOffice: Offers PDF editing features. PDFsam: Allows splitting, merging, and editing PDFs. Foxit Reader: Provides basic PDF viewing and editing capabilities. How do I compress a PDF file? You can use online tools like Smallpdf, ILovePDF, or desktop software like Adobe Acrobat to compress PDF files without significant quality loss. Compression reduces the file size, making it easier to share and download. Can I fill out forms in a PDF file? Yes, most PDF viewers/editors like Adobe Acrobat, Preview (on Mac), or various online tools allow you to fill out forms in PDF files by selecting text fields and entering information. Are there any restrictions when working with PDFs? Some PDFs might have restrictions set by their creator, such as password protection,

editing restrictions, or print restrictions. Breaking these restrictions might require specific software or tools, which may or may not be legal depending on the circumstances and local laws.

Find Economic And Social History Of Medieval Europe :

fm an introduction to frequency modulation 1st edition

flyng dragon and dancing phoenix an introduction to selected chinese minority folk dances

focus on democracy

folklore and the hebrew bible

flyng ark

fodors turkey 91

folk tales of old japan

folk devils and moral panics thirtieth anniversary edition

fodors 89 mexico with essays on art folklore and history

fluid dynamics for physicists

focus on geography key concepts and teaching strategies.

~~fodors florida 1988~~

folk traditions of the arab world a guide to motif classification.

flynn of the inland a & r classics

fodors france 2004

Economic And Social History Of Medieval Europe :

Download Issues And Ethics In The Helping Professions 8th ... Ethical and Social Issues in the Information Age. The Art of Integrative Counseling. Engaging Bioethics. Business Ethics: Case Studies and Selected Readings. Issues and ethics in the helping professions In this book, authors Corey, Corey and Callanan provide readers with the basis for discovering their own guidelines within the broad limits of professional ... Issues and Ethics in the Helping Professions - dokumen.pub ... Issues and Ethics in the Helping Professions, Seventh Edition featuring the. Personalized Learning Plan is an online suite of services and resources ... Issues and Ethics in the Helping... by Corey, Gerald Issues and Ethics in the Helping Professions (SAB 240 Substance Abuse Issues in Client Service). 8th Edition. ISBN-13: 978-0495812418, ISBN ... Issues and Ethics in the Helping Professions 8th Edition 1 Issues and Ethics in the Helping Professions 8th Edition ; 2 Introduction to Professional Ethics ; 3

Corey, 8e, ©2011, Brooks/ Cole - Cengage Learning Test Bank For Issues and Ethics in The Helping ... Test Bank for Issues and Ethics in the Helping Professions 8th Edition - Free download as PDF File (.pdf), Text File (.txt) or read online for free. Issues and Ethics in the Helping Professions by Gerald Corey Up-to-date and comprehensive, this practical best-selling text now available with an online personalized study plan, helps students learn how to deal with ... Issues and Ethics in the Helping Professions This contemporary and practical text helps you discover and determine your own guidelines for helping within the broad limits of professional codes of ... Issues and ethics in the helping professions This contemporary, comprehensive, and practical text helps you discover and determine your own guidelines for helping within the broad limits of ... Issues and ethics in the helping professions 0534614434 [This book] is written for both graduate and undergraduate students in the helping professions. This book is suitable fo... Jamie's Comfort Food Recipes 31 Jamie's Comfort Food recipes. Treat yourself, friends and family to delicious, feel good food with recipes from Jamie's book and TV show, Jamie's Comfort ... Comfort Food From smoky daals to tasty tikkas we've got some seriously good curries here - along with the all-important breads and sides - so you can feast without breaking ... Jamie Oliver's Comfort Food: The Ultimate Weekend ... Sep 23, 2014 — Recipes include everything from mighty moussaka, delicate gyoza with crispy wings, steaming ramen and katsu curry to super eggs Benedict, ... Jamie's Comfort Food Jamie's Comfort Food is a UK food lifestyle programme which was broadcast on Channel 4 in 2014. In each half-hour episode, Jamie Oliver creates three ... Jamie Oliver's Comfort Food: The Ultimate Weekend ... Jamie's Comfort Food is all about the food you really want to eat, made exactly how you like it. With this in mind, the book features ultimate versions of all- ... 38 Comfort Food Recipes ideas in 2023 - Jamie Oliver Comfort Food Recipes · Bbq Burgers, Burger Buns, Chicken Burgers, Salmon Burgers, Minced Beef Recipes, · Duck Recipes, Sausage Recipes, Jamie Oliver Dinner ... 15 comfort foods from Jamie Oliver to cook all winter long Nov 27, 2019 — Social Sharing · Steaming Ramen · Smoky Veggie Chili With Sweet Gem & Cheesy Jacket Spuds · Hot & Smoky Vindaloo with Pork Belly · Squash and ... Jamie's Comfort Food by Oliver, Jamie This is the food you really want to eat, made exactly how you like it. With this in mind, the book features ultimate versions of all-time favourites, and also ... Jamie's Comfort Food Jamie's Comfort Food ... One of Jamie Oliver's latest cookbooks which brings together 100 ultimate comfort food recipes that will put a huge smile on anyone's ... SOLUTIONS MANUAL FOR by MECHANICAL DESIGN OF ... SOLUTIONS MANUAL FOR by MECHANICAL DESIGN OF MACHINE COMPONENTS SECOND EDITION: SI VERSION. ... THEORY OF MACHINES AND MECHANISMS Third Edition · Adalric Leung. mechanical design of machine elements and machines This new undergraduate book, written primarily to support a Junior-Senior level sequence of courses in Mechanical Engineering Design, takes the viewpoint that ... Jack A. Collins, Henry R. Busby, George H. Staab- ... - Scribd Busby, George H. Staab-Mechanical Design of Machine Elements and Machines - A Failure Prevention Perspective Solution Manual-Wiley (2009) PDF. Uploaded by. Mechanical Design of Machine Components - Amazon.com Key Features of the Second Edition: Incorporates material that has been

completely updated with new chapters, problems, practical examples and illustrations ... Mechanical Design of Machine Elements and Machines Mechanical Design of Machine Elements and Machines - Solution Manual A Failure Prevention Perspective Second Edition Jack A. Collins, Henry R. Busby ... Solutions Manual For: Mechanical Design Of Machine ... Prerequisites: A. C. Ugural, MECHANICAL DESIGN of Machine Components, 2nd SI Version, CRC Press (T & F Group). Courses on Mechanics of Materials and ... Mechanical Design of Machine Elements and Machines Jack A. Collins is the author of Mechanical Design of Machine Elements and Machines: A Failure Prevention Perspective, 2nd Edition, published by Wiley. Henry R. Mechanical Design of Machine Elements and ... Jack A. Collins is the author of Mechanical Design of Machine Elements and Machines: A Failure Prevention Perspective, 2nd Edition, published by Wiley. Henry R. [Jack A. Collins, Henry R. Busby, George H. Staab](z-lib.org) Mixing equipment must be designed for mechanical and process operation. Although mixer design begins with a focus on process requirements, the mechanical ... Machine Elements in Mechanical Design, 6e Page 1. Page 2. MACHINE ELEMENTS. IN MECHANICAL. DESIGN. Sixth Edition. Robert L. Mott. University of Dayton. Edward M. Vavrek. Purdue University. Jyhwen Wang.