

Lower Palaeozoic reservoirs of North Africa

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Abstract: This paper provides an overview of features considered significant in the exploration and development of Lower Palaeozoic reservoirs of North Africa. Information is derived from a review of literature on the Lower Palaeozoic successions of north Africa, combined with outcrop observations from the Anti Atlas mountains of Morocco. The focus of the exploration-oriented part of the review is on identification of potential traps other than two-way structural dip closure. Stratigraphic elements described include depositional models of reservoir facies, tectonic unconformities and possible eustatic unconformities. Cases of established or potential trapping by post-depositional faulting, by diagenesis and by hydrodynamic flow are examined. Development-related topics highlighted include the impact on reservoir matrix quality of burial diagenesis and of palaeo-weathering at the Hercynian unconformity. Other issues discussed which additionally affect producibility from the reservoir matrix include tectonic fracturing, palaeotopography and unloading fracturing at the Hercynian unconformity, and induced fracturing within the present stress regimes.

The Cambrian to Silurian sequences of Algeria, Libya and Tunisia form one of the world's greatest concentrations of Lower Palaeozoic reservoirs. Algeria contains the largest number of fields discovered to date, including the giant field of Hassi Messaoud (Fig. 1). Libya also has substantial production from the Lower Palaeozoic, which is in the process of being boosted by new fields under development in the Murzuq Basin. Minor but potentially significant relatively

deep discoveries have also been made in Tunisia. Equivalent sequences in Egypt, Morocco (including former Western Sahara), Niger and Chad might also have hydrocarbon potential (see below).

To date, exploration for Lower Palaeozoic prospects has mainly focused on structural highs. As a consequence there are large areas, even close to producing fields, which remain undrilled. Most producing fields are situated on convincing

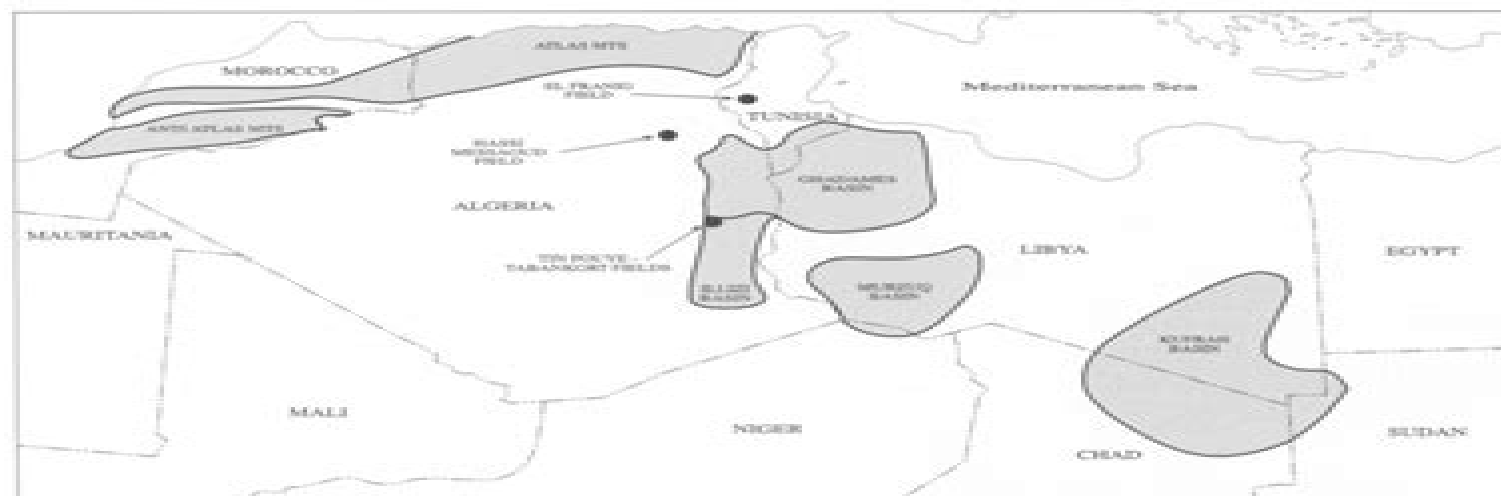


Fig. 1. North Africa locality map.

Lower Palaeozoic Of North Western And West Central Africa

**A.W. Hunter, J.J. Álvaro, B. Lefebvre, P.
Van Roy, S. Zamora**



Lower Palaeozoic Of North Western And West Central Africa:

Lower Palaeozoic of North-Western and West-Central Africa Charles H. Holland, **The Boundaries of the West African Craton** Nasser Ennih, Jean-Paul Liégeois, 2008 **Geological Exploration in Murzuq Basin** D.

Worsley, 2000-12-19 The Murzuq Basin is a large intracratonic sag basin located in southwestern Libya. Exploration efforts started in this vast and remote Saharan region already in 1957 and 60 exploratory wells have been drilled to date resulting in over 20 discoveries with around 4 000 million barrels of oil in place. Most discoveries have been made in Ordovician sandstone reservoirs sourced by hot shales of the Lower Silurian Tan ezzuft Formation. Oil is already being produced and exported from the area but the basin's total hydrocarbon potential is still poorly understood. Recent exploration, especially the major discovery and initial development of the Giant Elephant Field, has greatly increased interest for the area's potential. Many petroleum geologists and companies now believe that the basin may well develop into a new major hydrocarbon province which will significantly contribute to Europe's energy needs in the next decades. This book presents papers from a conference held at Sebha University on the eastern margins of the Murzuq Basin in September 1998. The book continues an ongoing series of presentations of the geology of Libya but the 25 contributions herein mostly centre on the Murzuq Basin itself and on nearby areas. There are still many unresolved questions in terms of geological and hydrocarbon exploration in these difficult desert areas but the papers herein will hopefully present a first comprehensive overview of an exciting frontier exploration region. About half of the papers are directly related to hydrocarbon exploration and to source rock and reservoir development but a wide variety of other features are also described ranging from palaeontology and biostratigraphy to ore geology and water resources covering the entire geological column from the Precambrian to the Holocene. The book concludes with a bibliography covering all geological aspects of this challenging but very promising frontier area. *The Geology of North Africa* Zakaria Hamimi, Moulley Charaf Chabou, Ezzoura Errami, Abdel-Rahman Fowler, Nuri Fello, Amara Masrouhi, Rémi Leprêtre, 2024-05-20 This richly illustrated book reviews the geology, tectonics, sedimentary basins and strategic resources of North Africa in 21 chapters. Chapter 1 is a regional synthesis. Chapter 2 examines the deep crustal and upper mantle structure. Chapter 3 compares the West African Craton. Chapters 4, 5, 6, 7 deal with Pan African Variscan Hercynian and Alpine Belts. Precambrian Geology of Hoggar Shield, north Central Africa, will be addressed in Chapter 8. The North African Neoproterozoic and Phanerozoic sedimentary basins are the topic of Chapter 9. Phanerozoic magmatism and geodynamic framework of North Africa are addressed in Chapter 10. Chapters 11, 12 deal with petroleum geology and water resources. Important non-metallic and metallic ore deposits are presented in Chapter 13, 14, 15, 16. Chapters 17, 18 explore geothermal energy and other strategic resources. Chapters 19, 20 discuss seismicity, seismotectonics and Neotectonics and Advances of exploration geophysics in North Africa. The last two chapters, 20, 21 focus on meteoric impact craters, geoheritage, geoparks and geotourism in North Africa. The Formation and Evolution of Africa Douwe J. J. van Hinsbergen, 2011 The

African continent preserves a long geological record that covers almost 75% of Earth's history. The Pan African orogeny c 600-500 Ma brought together old continental kernels West Africa, Congo, Kalahari and Tanzania to form Gondwana and subsequently the supercontinent Pangaea by the late Palaeozoic. The break up of Pangaea since the Jurassic and Cretaceous primarily through opening of the Central Atlantic, Indian and South Atlantic oceans in combination with the complicated subduction history to the north gradually shaped the African continent. This volume contains 18 contributions that discuss the geology of Africa from the Archaean to the present day. *African Basins* R.C. Selley, 1997-11-20. Following on from the first 2 books in the series *Sedimentary Basins of the World* which covered Chinese Sedimentary Basins Volume 1 and South Pacific Sedimentary Basins Volume 2 comes Volume 3 on African Basins. Africa covers a larger land area than the USA, Europe, India and the ASEAN nations put together. It is rich in natural resources including oil, gas, coal and nearly every metalliferous mineral. Yet Africa is still one of the least explored continents. This book brings together in one volume concise reviews of basins previously documented in a vast array of diffuse literature. It also contains some of the first detailed accounts of several basins which have never before been described in such depth. These include the onshore Owambo, Iullemmeden and Sudanese rift basins and the offshore basins of southern Africa. The contributions are by authors and teams of authors with great knowledge and experience of the basins that they describe. The thirteen chapters are arranged in 3 parts covering North Africa, Central Africa and Southern Africa and the book is illustrated by maps, cross sections, stratigraphic sections and seismic lines. Each chapter includes a comprehensive bibliography and the book concludes with a subject index. For academic geologists researching the geology of Africa and for industrial geologists seeking natural resources within African sedimentary rocks, this book is an invaluable source of information.

Geology of Western Gondwana (2000 - 500 Ma) Roland Trompette, 2020-08-26. In considering the geology of Western Gondwana, this text covers the Pan African Brasiliano cratons, the Pan African Brasiliano fold belts and mosaic of Pan African Brasiliano mini cratons and minor fold belts. Northeast Brazil and the Central Western portion of Africa. Palaeozoic Reefs and Bioaccumulations J. Javier Álvaro, 2007. The geological record contains a fascinating diversity of reefs and shell accumulations. As with many other biosedimentary structures, their facies characterization requires careful observation at outcrop and sample scale and in thin section to provide information about the global geometries, fabrics and textures respectively. This collection of papers encompasses the breadth of sedimentary geometries and facies displayed by Palaeozoic reefs, shell accumulations and transitional composite deposits. The definition of reefs and shell concentrations has given rise to variations in nomenclature. The papers in this volume cover specific problems regarding the nomenclature and facies characterization of reefs, shell accumulations and transitional composite deposits. However, rather than attempt a complete revision of terms, the authors have touched on some of the important issues at this stage of development in the field: the main climatic, environmental and evolutionary factors that controlled the Palaeozoic development of shell accumulations and reefs. **A**

Global Synthesis of the Ordovician System: Part 2 T. Servais, D.A.T. Harper, B. Lefebvre, I. G. Percival, 2023-06-08 The Ordovician was one of the longest of the geological periods characterized by major magmatic and tectonic activity an immense biodiversification swings in climate and sea levels and the first Phanerozoic mass extinction A Global Synthesis of the Ordovician System is presented in two volumes in The Geological Society Special Publications Whereas the first volume SP532 concentrates on general aspects and a synthesis of the Ordovician geology of Europe this volume SP533 includes reviews of Ordovician successions of most other parts of the world The classic successions of the Ordovician basins of North America are presented as well as those of China where several of the Ordovician Global Boundary Stratotype Sections and Points are defined The volume also includes syntheses of the Ordovician geology of Africa South America most regions of Asia from the Near to the Far East along with Central Asia as well as Australia New Zealand and Antarctica **Glaciogenic Reservoirs and Hydrocarbon Systems** Mads Huuse, J. Redfern, D. P. Le Heron, R. J. Dixon (Geologist), A. Moscariello, Jonathan Craig, 2012 Glaciogenic reservoirs and hydrocarbon systems occur intermittently throughout the stratigraphic record with particular prominence in Neoproterozoic Late Ordovician Permo Carboniferous and Late Cenozoic strata Recent interest in glaciogenic successions has been fuelled by hydrocarbon discoveries in ancient glaciogenic reservoirs in North Africa the Middle East Australia and South America Glaciogenic deposits of Pleistocene age are noteworthy for their content of groundwater onshore and potentially prospective and or hazardous gas accumulations offshore The abundant imprints of Pleistocene glaciations in both hemispheres can be used to reconstruct complex histories of repeated ice cover and retreat and glacier bed interactions thus informing our view on the dynamics of older ice caps and predictions of future glaciations This volume aims to provide a better understanding of glaciogenic processes their stratigraphic record and reservoir characteristics of glaciogenic deposits The book comprises 3 overview papers and 16 original case studies of Neoproterozoic to Pleistocene successions on 6 continents and will be of interest to sedimentologists glaciologists geophysicists hydrologists and petroleum geologists alike P 4 of cover **The West African Orogens and Circum-Atlantic Correlatives** R.D. Dallmeyer, J.P. Lecorche, 2012-12-06 In December 1987 Project 233 of the International Geological Correlation Program hosted an international conference in Nouakchott Mauritania Discussions were focused on the Tectonothermal Evolution Of The West African Orogens And Circum Atlantic Terrane Linkages A wealth of new information was presented during the conference and it was apparent that the time was appropriate to prepare a systematic volume dealing with the geology of northwest Africa The present volume is an outgrowth of this conference but is not merely a compilation of the papers presented in Nouakchott Instead it represents a coordinated volume designed to present a balanced comprehensive view of our present understanding of West African geology and potential correlations in other Circum Atlantic Paleozoic orogens We sincerely appreciate the efforts of all the reviewers whose comments have greatly helped to improve the quality of this volume We also thank the various contributors for their diligence and perseverance in

manuscript preparation The calibre of the present volume is a reflection of their labor Athens Marseille Autumn 1990 R D DALLMEYER J P LECORCHE Contents Chapter 1 Introduction 3 R D DALLMEYER and J P LECORCHE Chapter 2 Geophysics and the Crustal structure of West Africa 9 J ROUSSEL and A LESQUER Chapter 3 Crystalline Basement of the West African Craton 31

Geology of the Appalachian—Caledonian Orogen in Canada and Greenland Harold Williams,1995 This volume focuses on the Canadian Appalachian region The chapter on the East Greenland Caledonides stands alone and there is no attempt to integrate the geological accounts of the two far removed regions Rocks of the Canadian Appalachian region are described under four broad temporal divisions lower Paleozoic and older middle Paleozoic upper Paleozoic and Mesozoic The rocks of these temporal divisions define geographic zones belts basins and graben respectively The area is of special interest because so many modern concepts of mountain building are based on Appalachian rocks structures

Geophysical Exploration for Hydrocarbon Reservoirs, Geothermal Energy, and Carbon Storage Said Gaci,2025-08-25 A practical guide to the latest technologies and techniques in subsurface energy exploration In Geophysical Exploration for Hydrocarbon Reservoirs Geothermal Energy and Carbon Storage New Technologies and AI based Approaches distinguished researcher Said Gaci delivers a practice oriented overview and comparison of the concepts methods and workflows for the geophysical characterization of hydrocarbon and geothermal reservoirs including those reservoirs suitable for large scale carbon sequestration Organized into four parts the book begins with a summary of novel petroleum exploration technologies and discussions of illustrative case studies from around the world It then explains how to integrate seismic and other non invasive surveying methods for a comprehensive multiscale reservoir characterization The third part explores the implementation of artificial intelligence tools in remote exploration rock typing and fluid prediction The final part demonstrates how to apply hydrocarbon exploration methods to the exploration and development of geothermal reservoirs and underground carbon dioxide storage sites Readers will find A multidisciplinary approach to combining conventional hydrocarbon exploration techniques with the power of artificial intelligence A thorough understanding of subsurface reservoir systems that links recent technical advances with new geological insights Practice oriented discussions of advanced technologies for non invasive reservoir characterization Selected case studies that illustrate the application of novel concepts in a real world setting Perfect for geologists geoengineers geophysicists and fossil fuel professionals Geophysical Exploration for Hydrocarbon Reservoirs Geothermal Energy and Carbon Storage will also benefit anyone aiming to remain at the forefront of subsurface energy exploration in the twenty first century

Late Paleozoic Glacial Events and Postglacial Transgressions in Gondwana Oscar R. López-Gamundí,Luis A. Buatois,2010

Avalonian and Related Peri-Gondwanan Terranes of the Circum-North Atlantic Damian Nance,Margaret D. Thompson,1996-01-01

Papers from the 6th International Conference on Trilobites and their Relatives Alan W. Owen,David L. Bruton,2019-09-10 A volume from a monograph series featuring seven papers on trilobites with brief summaries This research volume is entitled Papers from the 6th

International Conference on Trilobites and their Relatives It s Volume 64 within the Fossils and Strata monograph series The research compilation originated from a 2017 conference in Estonia Seven papers on trilobites are included with summaries in the publication The papers topics cover trilobites from the Early Cambrian to the Late Devonian **The Great Ordovician Biodiversification Event: Insights from the Tafilalt Biota, Morocco** A.W. Hunter,J.J. Álvaro,B. Lefebvre,P. Van Roy,S. Zamora,2022 Special Publication 485 About 40 million years after the Cambrian Explosion the Great Ordovician Biodiversification Event GOBE represents a second and dramatic burst in marine biodiversity with major changes in the structure of ecosystems and the progressive replacement of the distinctive Cambrian Evolutionary Fauna by the Paleozoic Evolutionary Fauna However the GOBE is not a single worldwide short term event but rather the complex sum of successive diversifications occurring in distinct taxonomic groups trophic guilds and regions This book focuses on the Late Ordovician Tafilalt Biota Anti Atlas Morocco which provides a snapshot of the GOBE in high latitude regions of the Southern Hemisphere A series of contributions explore different aspects of the Tafilalt Biota including its geological setting the international fossil trade in this area and a series of detailed systematic contributions describing many new taxa of marine invertebrates This volume represents a significant contribution to the understanding of the Tafilalt Biota and its significance to the GOBE

Regional Geology and Tectonics: Phanerozoic Passive Margins, Cratonic Basins and Global Tectonic Maps A.W.

Bally,2012-05-31 Expert petroleum geologists David Roberts and Albert Bally bring you Regional Geology and Tectonics Phanerozoic Passive Margins Cratonic Basins and Global Tectonic Maps volume three in a three volume series covering Phanerozoic regional geology and tectonics Its key focus is on both volcanic and non volcanic passive margins and the importance of salt and shale driven by sedimentary tectonics to their evolution Recent innovative research on such critical locations as Iberia Newfoundland China and the North Sea are incorporated to provide practical real world case studies in regional geology and tectonics The vast amount of volcanic data now available to form accurate hydrocarbon assessments and analysis at passive margin locations is also included into this thorough yet accessible reference Named a 2013 Outstanding Academic Title by the American Library Association s Choice publication A how to practical reference that discusses the impact of the development of passive margins and cratonic basins on the structural evolution of the Earth in regional geology and tectonic applications Incorporates the increased availability of industry data to present regional seismic lines and cross sections leading to more accurate analysis and assessment of targeted hydrocarbon systems Analyses of passive margins and cratonic basins in East Africa China Siberia the Gulf of Suez and the Laptev Sea in the Russian Arctic provide immediately implementable petroleum exploration applications Summaries of analogue and theoretical models are provided as an essential backdrop to the structure and stratigraphy of various geological settings *From Geoheritage to Geoparks* Ezzoura Errami,Margaret Brocx,Vic Semeniuk,2015-01-13 This unique book is dedicated to helping promote geoheritage geoconservation and geoparks in Africa and the Middle East Local regional global and thematic case studies

including a geoheritage toolkit are used to illustrate the scope and depth of geoheritage and highlight some current geoparks and aspiring candidates in Africa the Middle East China Europe and Australia This special issue mainly consists of the proceedings of the First International Conference on Geoparks in Africa and Middle East FICGAME held in El Jadida Morocco in 2011 The conference hosted by the Faculty of Sciences of Chouaib Doukkali University was organized by the African Geoparks Network and the African Association of Women in Geosciences in collaboration with the UNESCO Cairo Office

Petroleum Geology of Libya Don Hallett, Daniel Clark-Lowes, 2017-03-08 Petroleum Geology of Libya Second Edition systematically reviews the exploration history plate tectonics structural evolution stratigraphy geochemistry and petroleum systems of Libya and includes valuable new chapters on oil and gas fields production and reserves Since the previous edition published in 2002 there have been numerous developments in Libya including the lifting of sanctions a new licensing system with licensing rounds in 2004 2005 2006 and 2007 many new exploratory wells discoveries and field developments and a change of regime A large amount of new data has been published on the geology of Libya in the past fourteen years but it is widely scattered through the literature Much of the older data has been superseded and several of the key publications especially those published in Libya are difficult to access This second edition provides an updated source of reference which incorporates much new information particularly on petroleum systems reserves oil and gas fields play fairways and remaining potential It presents the results of recent research and a detailed description of Libyan offshore geology The book includes an extensive and comprehensive bibliography Presents over 180 full colour illustrations including maps diagrams and charts illustrating the key concepts in a clear and concise manner Authored by two recognized world authorities on geology in Libya with over 40 years experience in Libya between them Provides an expanded and updated version of the bestselling previous edition nicknamed the Explorationist's Bible Lays the foundation for the post revolution exploration age in Libya

Reviewing **Lower Palaeozoic Of North Western And West Central Africa**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is truly astonishing. Within the pages of "**Lower Palaeozoic Of North Western And West Central Africa**," an enthralling opus penned by a very acclaimed wordsmith, readers set about an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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Table of Contents Lower Palaeozoic Of North Western And West Central Africa

1. Understanding the eBook Lower Palaeozoic Of North Western And West Central Africa
 - The Rise of Digital Reading Lower Palaeozoic Of North Western And West Central Africa
 - Advantages of eBooks Over Traditional Books
2. Identifying Lower Palaeozoic Of North Western And West Central Africa
 - 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 Lower Palaeozoic Of North Western And West Central Africa
 - User-Friendly Interface
4. Exploring eBook Recommendations from Lower Palaeozoic Of North Western And West Central Africa
 - Personalized Recommendations

- Lower Palaeozoic Of North Western And West Central Africa User Reviews and Ratings
- Lower Palaeozoic Of North Western And West Central Africa and Bestseller Lists
- 5. Accessing Lower Palaeozoic Of North Western And West Central Africa Free and Paid eBooks
 - Lower Palaeozoic Of North Western And West Central Africa Public Domain eBooks
 - Lower Palaeozoic Of North Western And West Central Africa eBook Subscription Services
 - Lower Palaeozoic Of North Western And West Central Africa Budget-Friendly Options
- 6. Navigating Lower Palaeozoic Of North Western And West Central Africa eBook Formats
 - ePub, PDF, MOBI, and More
 - Lower Palaeozoic Of North Western And West Central Africa Compatibility with Devices
 - Lower Palaeozoic Of North Western And West Central Africa Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Lower Palaeozoic Of North Western And West Central Africa
 - Highlighting and Note-Taking Lower Palaeozoic Of North Western And West Central Africa
 - Interactive Elements Lower Palaeozoic Of North Western And West Central Africa
- 8. Staying Engaged with Lower Palaeozoic Of North Western And West Central Africa
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Lower Palaeozoic Of North Western And West Central Africa
- 9. Balancing eBooks and Physical Books Lower Palaeozoic Of North Western And West Central Africa
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Lower Palaeozoic Of North Western And West Central Africa
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Lower Palaeozoic Of North Western And West Central Africa
 - Setting Reading Goals Lower Palaeozoic Of North Western And West Central Africa
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Lower Palaeozoic Of North Western And West Central Africa
 - Fact-Checking eBook Content of Lower Palaeozoic Of North Western And West Central Africa

- 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

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