Announcing!

**STRATIGRAPHY OF THE EASTERN AND CENTRAL UNITED STATES**

*VOLUME II OF HISTORICAL GEOLOGY OF NORTH AMERICA*

*By Charles Schuchert*

Late Professor Emeritus of Paleontology, Yale University

This volume discusses stratigraphic sequences in thirty states, listing and describing a great many formations, citing original places of definition and other references, together with synonyms. Fossil lists are given for the more important formations. There are about eighty correlation charts made especially for the book, as well as similar tables taken from other stratigraphic reports, and many state geologic maps. The stratigraphy discussed is chiefly of the Paleozoic formations; however, along the Atlantic Coastal Plain considerable of the well-known Mesozoic and Cenozoic marine history is also presented. The marine Mesozoic formations in the western part of the central states are also described.

**PART I** follows an introductory chapter on stratigraphic terminology. This first main section deals with New York State.

**PART II** covers the eleven states lying across the Appalachian Geosyncline, beginning with Pennsylvania and New Jersey, going across Maryland and Old and Little Virginias, East Tennessee, the western parts of the Carolinas, Georgia, and northern Alabama, and the small part of Mississippi that shows the Paleozoic formation.

**PART III** deals with the states of the Atlantic Coastal Plain, and completes the geological history of the Appalachian province. The territory covered includes the land beneath the marine waters off the New England coast, Long Island, New Jersey, Delaware, eastern Maryland, Virginia, the Carolinas, Georgia, Florida, and the Gulf Coastal Plain from western Georgia to Texas and the entire length of eastern Mexico.

**PART IV** describes the states that lie across the Cincinnati Anticline—central and western Tennessee, Kentucky, Ohio, Indiana, and Michigan.

**PART V** discusses the states that are conditioned structurally by the Ozark Dome—Illinois, Missouri, and Iowa.

**PART VI** covers Wisconsin and Minnesota.

**PART VII** deals with the Plains States—North and South Dakota, Nebraska, and Kansas.

**PART VIII** is the concluding section, covering Arkansas, Oklahoma and Texas, which lie north and west of the borderland Llanoria.

1013 pages 209 illustrations 6 by 9 $15.00

(Volume I. Antillean-Caribbean Region. 1935. 811 pages. 6 by 9. $10.00)

JOHN WILEY & SONS, Inc., 440 4th Ave., NEW YORK
SOME PAPERS READ AT THE NEW YORK MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Industrial progress in America is usually attributed to our natural resources, but few people realize that Americans, more than any other people of the world, have been responsible for the epoch-making inventions of the century. This was pointed out by A. A. Potter, dean of engineering at Purdue University, at the New York meeting of the American Society of Mechanical Engineers. Vital, young Americans, initiative spurred by their individual democratic rights being placed above those of the state, have produced some of the greatest of these discoveries. Westinghouse invented the airbrake at 21, for example, McCormick the harvester at 22, and Howe the sewing machine at 27. McCormick with his reaper gave more impetus to mechanized agriculture than any person in any other country. Among pioneer American inventions in the field of communication have been telegraph, transatlantic cable, telephone and many features of the radio. From the invention of the Clermont by Fulton to the patent for the airplane by Wright, Americans have been major contributors to the field of transportation. Many manufacturing processes are also included among American achievements, such as welding, crackling gasoline, vulcanizing rubber and the manufacture of aluminum and plastics. Our patent system, which encourages and rewards creative talent, has been a major factor in the industrial progress of this country, Dean Potter declared.

Infra-red rays are now being used to dry textiles after dyeing and finishing processes, was reported by George Fisher, of the Infra-Red Ray Equipment Corporation. Bombarding fabrics with the rays produces great heat, although infra-red waves themselves are not hot. This property of the rays has been known for some time, but application in the textile industry has only recently been made. Use of infra-red rays produced by gas-heated incandescent refractories has passed the experimental stage. Quite a number of such installations are in industrial operation, performing with excellent results. Since the rays do not heat the surrounding air, the high-speed production of large amounts of heat energy occurs right at the spot where the heat is needed. Operation has proved to be very economical. Steam heat, formerly used, could not be controlled as well as the new method and as a result the fabric was sometimes excessively exposed to heat and baked. Atmospheric burners and other gas-flame units which have been in use wasted much heat to the surrounding air and had other features which prevented drying as efficiently as by the infra-red ray method.

Speeding trains of the future will be powered by diesel electric locomotives which will far surpass anything that we have yet seen, was predicted by B. S. Cain, of the locomotive engineering department of the General Electric Company. Design progress has not stopped despite standardization required by the war. Instead, war research has produced power plants with greater power in less space with less weight and designed for mass production. When peace comes, locomotive builders are ready to adapt these developments to railroad use. Production for the duration is limited to existing standard sizes and types best suited to wartime needs and emphasis is placed on the most efficient use of the limited material available. Use of small diesel-electric locomotives in industrial service has increased tremendously. These high-speed 150 to 500 horsepower engines are not in as great demand for implements of war as the large low-speed machine.

A shooting stream of gas is used to drive the first gas-turbine locomotive, which was described by Paul R. Sidler, of New York, resident engineer of Brown, Boveri & Company, Ltd. Built for the Swiss Federal Railways, the new-type locomotive has not been tested as thoroughly as desired because of fuel shortage and war conditions. But enough road tests over various tracks have been made to demonstrate that the gas-turbine locomotive not only came up to expectations but surpassed them in some respects. For certain uses it shows marked advantages over the Diesel locomotive, but in general it is not yet a serious competitor. It should be particularly suitable for express service over long distances, in areas where water is scarce and where there is a considerable difference in the costs of Diesel oil as against ordinary fuel oil.

That the use of wood in America's planes is steadily advancing in both quantity and quality, was reported by Dr. Robert J. Nebesar, chief engineer of the Universal Moulded Products Corporation. Aircraft with wooden fuselages and other parts have been shown to withstand shock and vibration very satisfactorily. Both servicing and repairs are inexpensive and comparatively easy to take care of, these presenting no engineering problems. New durable synthetic glues and ensuing improvements in wood processing, such as molding, pressing and other techniques, has resulted in an ever-increasing replacement of war-scarce metals by wood in some types of planes.

THE CONSERVATION OF VITAL MATERIALS

More than ten million pounds of nickel, chromium and molybdenum will be saved next year in the production of medium tanks alone, through the research of the War Engineering Board of the Society of Automotive Engineers is reported in the Journal of the society.

Cooperation of industry and the military, through research sponsored by the board, is expected to produce other large savings. Materials conservation is now being incorporated in the designs and specifications of new army equipment. Use of low-grade metals is being expedited to release the better alloys for more critical uses.

Recent piece-by-piece study of military motor vehicles, conducted by the board, involving thousands of parts, reduces consumption of vital materials, such as rubber,
IMPORTANT McGRAW-HILL TEXTS for War Training Courses

By P. V. H. WEEMS, Lt. Comdr., U. S. Navy (Retired). In press—ready in January
An authoritative, practical treatment of all the information on fundamentals, equipment, computations, methods of procedure, etc., necessary for a complete training in air navigation. The book has been radically revised to include the latest methods and equipment, such as the Air Almanac, the new Link Averaging Sextant, the Star Altitude Curves, the Mark II Plotter, etc.

Aerophotography and Aerosurveying
By J. W. BAILEY, Lecturer at the Institute of Geographical Exploration, Harvard University. 324 pages, $3.50
Covering the fields of standard mapping and exploration mapping, this book deals with aerial photographs, standard laboratory practice, and the various methods of utilizing aerial photographs for making standard and exploratory maps, mosaics, and engineering surveys.

Microwave Transmission
By J. C. SLATER, Professor of Physics, Massachusetts Institute of Technology. International Series in Physics. 309 pages, $3.50
Steers a middle course between very elementary and very advanced standards; between the highly theoretical and the completely practical. Discusses transmission lines; Maxwell's equations, plane waves, and reflection; rectangular wave guides; radiation from antennas; etc.

Frequency Modulation
By AUGUST HUND, Member of the Navy Radio and Sound Laboratory, San Diego, California. Radio Communication Series. 375 pages, $4.00
A critical engineering treatment of all phases of frequency modulation, from basic principles to the design of commercial apparatus. The practical applications follow closely the latest and best engineering practice. Provides up-to-date information on circuit design.

Mathematics for Electricians and Radiomen
By N. M. COOKE, Lt. (j.g.), U. S. Navy; Chief Instructor, Radio Materiel School, Washington, D. C. 604 pages, $4.00
Aims to give the electrical and radio student a sound mathematical foundation and to show him how to apply this knowledge to the solution of practical problems most frequently encountered in actual practice. Covers elementary algebra through quadratic equations, logarithms, elementary plane vectors, etc.

Principles of Aeronautical Radio Engineering
By P. C. SANDBERTO, Major, Directorate of Communications of the U. S. Army Air Forces. 414 pages, $3.50
The first adequate treatment in book form of the engineering aspects of aeronautical radio. Topics covered include radio for navigation, the United States range system, aircraft ultra-high-frequency range receiver, radio compass, microwave markers, principles of instrument-landing systems, distance indicators, etc.

Radio Navigation for Pilots
By C. H. MCINTOSH, Assistant Superintendent of Flying School Operations, American Airlines, Inc. 175 pages, $2.00
Presents radio navigation from an aircraft viewpoint, limited to the practical treatment demanded by pilots. Half of the book is devoted to radio range navigation and necessary flight techniques, and the other half to radio-direction finding as a navigational aid. Discusses beam techniques, orientation methods, the instrument approach, loop navigation techniques, etc.

Practical Mathematics for Home Study.
New fourth edition
By the late C. I. PALMER. Revised by S. F. BINS, Associate Professor of Mathematics, Illinois Institute of Technology. 697 pages, $4.00
Gives concise treatments of arithmetic, algebra, geometry, and trigonometry and logarithms. Principles and rules are clearly stated in simple, understandable language, and are illustrated by examples and sample solutions of problems. The new edition offers completely revised sets of problems.

Meteorology and Air Navigation.
New second edition
By HERT A. SHIELDS, Lt. Comdr., U. S. Naval Reserve. 288 pages, $2.25
A revision and expansion of Parts III and IV of the author's well-known Air Pilot Training. A chapter on navigation problems has been added; the various steps in solving off-course problems are carefully explained, including the radius of action type of problem. The Dalton Computer is discussed.

Send for copies on approval

McGRAW-HILL BOOK COMPANY, INC.
330 West 42nd Street, New York, N. Y. Aldwych House, London, W.C.2
aluminum and cork, and utilizes suitable substitutes. Development of cold-starting aids for military motorized equipment is among the current projects. Sufficient progress has been made to supply the Army with satisfactory expedients for this winter. Plans under way expect to make American armed forces the world's best equipped for sub-zero operations.

Other research projects contemplate development of equipment for the American army and navy which will assure satisfactory service in any climate in the world, with both production and servicing using a minimum amount of materials.

An "interim" secondary butyl tire has been developed by a committee created by the board, which appears capable of 15,000 miles of service and satisfactory for synthetic recapping materials. Manufacturers are cooperating in laboratory and field tests with the idea of making the material available for use in 1943.

**THE NATIONAL HEALTH**

The national health picture is "pretty good," according to reports of communicable diseases received weekly by the U. S. Public Health Service.

The death rate in large cities has increased some 12 per cent. or 13 per cent. in recent weeks, chiefly because of influenza and pneumonia. Death rates from these two diseases are higher than the three-year average established by the service for basis of comparison since the introduction of the sulfanilamide drugs which have so greatly reduced deaths from pneumonia.

Cases of influenza reported by state health officers have also been increasing, from 1,596 for the week ending November 14 to 1,851 for the week ending November 28, latest on which figures are available. About 60 per cent. to 70 per cent. of the cases for the recent weeks were reported from Texas, South Carolina and Virginia. So far, however, no signs of an influenza epidemic have appeared.

Meningococcus meningitis cases have been running higher all this year than during any year since 1937. The total number of cases for the week ending November 28 were 89, an increase of 25 over the number reported for the previous week. The five-year median figure runs around 30 cases per week for the nation. Only 17 cases have been reported from the nine service commands of the Army. Although the total number of cases in the nation is higher than usual, it does not represent any particular outbreak.

The largest number of cases of endemic typhus fever will probably be reported this year to the Public Health Service. More than 3,300 cases have been recorded so far, most of them from Texas and Georgia. The federal health service has been receiving reports on this disease since about 1930. Endemic typhus fever in the United States is a mild disease, spread by the rat flea, and not to be confused with the highly fatal European typhus fever.

**ITEMS**

Controversy over whether atabrine, the anti-malarial just made official in this country, is identical and equal to the original product developed in Germany, has now been settled in favor of America's chemists. A report issued by the National Research Council establishes the fact that the drug manufactured in this country is comparable in every respect with that produced in other countries, according to the Journal of the American Medical Association. Atabrine, chemically known as quinacrine, is now in mass production as a substitute for quinine using the process developed abroad. But chemists here have also found their way through the intricate steps of chemical synthesis which produce the bright yellow crystals used to combat malarial fever. Unpleasant side-actions sometimes accompany the administration of the drug led to the suspicion that there might be defects in the manufacturing process or impurities present. Doubts have been dispelled by investigations in leading institutions throughout the country which indicate that these minor difficulties are inherent in the atabrine itself, as occurs in many standard medicines.

New resins are replacing old zeolite minerals and greasenands for special uses requiring softened water of excellent quality, such as in breweries, canneries and beverage manufacturers. Extended application of the resins to prevent spoilage of medicinal enzyme preparations, to purify drugs, and to recover vitally needed metals from industrial wastes, was predicted by Dr. Robert J. Meyers of the Resinous Products and Chemical Company Laboratories of Philadelphia, speaking at the Buffalo meeting of the Western New York Section of the American Chemical Society.

With two great bulbous projections above the middle ear region, one of the most singular mammalian skull fossils ever seen has been described at the Academy of Natural Sciences, Philadelphia, with a scientific name that means "strange skull": Xenocranium. The name was bestowed by Dr. Edwin H. Colbert. The extinct creature, represented only by a skull and lower jawbone, lived in what is now Wyoming some 60,000,000 years ago, near the beginning of the Age of Mammals, in the period called Oligocene by geologists. It belonged to the class known as edentates, which includes modern armadillos and their relatives.

Fossil bones of a groundhog that slept too long one winter some scores of thousands of years ago in its burrow on a mountainside in New Mexico tell a story of cooler, moister climate in the Southwest while the North was buried under its mile-thick blanket of ice. The find, and the consequent climatic inferences, are reported in the American Journal of Science by Dr. Charles E. Sterns, of Tufts College. The bones were found in a dust pocket, under a long-inactive landslide on a mountainside north of Albuquerque, at an altitude of 5,900 feet. The lowest altitude at which marmots live in that area now is about 4,000 feet higher than that. It is not known whether the animals must have the cooler climate of that altitude; but that is not of vital importance, because the green food on which the animals depend does not grow the year round in the more arid conditions prevailing at lower levels in the Southwest. So the presence of marmot remains at the 5,900-foot altitude argues for a cooler, moister climate at the time they lived there.
The Technicon Constant Temperature Water Bath
for Spreading Paraffin Sections

Diameter 250 mm., inside Depth 100 mm.

Technicon Electric Paraffin Knife
Patent Pending

For trimming, separating and mounting blocks.

THE TECHNICON CO.

NEW YORK - - N. Y.
“Dear Mom...I never felt better in my life”

Isn’t it wonderful, Mother, to get a letter like that from your boy wherever he is... Iceland, Ireland, Australia, or a camp in the U. S. A.

Remember how you used to worry about his health when he was a little fellow... how secure you felt in the house on Greene Street because it was just around the corner from Doc Brown’s?

Right now your boy is getting the finest medical care in the world. No matter where he is, he’s never farther than “just around the corner” from an army doctor... and a mighty good doctor he is, too.

That doctor, as all American doctors are, is armed with the knowledge that has grown out of advanced microscopical research... research that was made possible by Bausch & Lomb’s introduction of quantity production of quality microscopes.

Today, in every field hospital, and in every base hospital a microscope stands ready to aid your boy’s doctors... to ferret out the enemy that hides in the water and the air and the insect’s sting... to aid in the diagnosis of disease.

And out on the battle lines, as on industrial fronts, Bausch & Lomb Instruments are creating winning standards of precision. In your homes, schools and shops, modern eyewear, as prescribed and fitted by men who have made the study of human vision a life’s work, continues to do its part for the eyes of a working America.
STOKES GAUGES

For Accurate Quantitative Readings of High Vacuum in Rapid Succession

Efficiency in high vacuum practice demands accurate measurement, in laboratory or manufacturing plant. These gauges make it possible.

They are compact, rugged, convenient to use. Readings are taken in only a few seconds, without the aid of any assisting gauge, reference vacuum, batteries or electrical connections. Used as portable instruments or on fixed mountings. Widely applicable in all vacuum operations within the micron and 5 mm. ranges.

More than 1000 of these instruments are now in use, in physics, organic and physical chemistry laboratories and by Industry... for applications such as drying blood plasma and biologicals from the frozen state, organic distillation under higher vacuum than heretofore (in which ordinary closed-end manometers are not adequate) and for testing efficiencies of vacuum methods, apparatus and systems.

New Bulletin No. 42-G describes these improved instruments, their many uses, contains specifications, prices, etc.

F. J. STOKES, MACHINE COMPANY
5958 Tabor Road Olney P. O. Philadelphia, Pa.

ANALYTICAL REAGENTS

Coleman & Bell
Analytical Reagents are manufactured to meet definite standards of purity, including the specifications of the Committee on Analytical Reagents of the American Chemical Society. Our list includes all of the common items and many rare and unusual compounds suitable for special analytical procedures.

Catalog upon request

THE COLEMAN & BELL CO.
MANUFACTURING CHEMISTS
NORWOOD, OHIO, U. S. A.

Determination of Alcohol in Blood and Urine
(According to the method of H. A. Heise)

The LaMotte Research Department has developed a new, portable, self-contained Outfit for the quantitative determination of Alcohol in the blood and urine. The distillation assembly, accurate color standards, standardized reagents and all equipment is mounted in the case itself and is ready to use on a moment's notice. Standard equipment includes thermostatically controlled electric hotplate for 110-112 Volt A.C. current.

This new LaMotte Outfit comes complete, ready to use, with instructions. Price $50.00 F.O.B. Towson.

Write for further information:
LaMotte Chemical Products Co.
Dept. "H" Towson, Baltimore, Md.

THE SCIENCE PRESS
PRINTING COMPANY

PRINTERS OF
SCIENTIFIC AND EDUCATIONAL JOURNALS, MONOGRAPHS AND BOOKS

Correspondence Invited
LANCASTER, PENNSYLVANIA
... and all returned safely

Enemy anti-aircraft shells and fighter planes are not the only hazards to American Airmen. Successful operations depend also on the mechanical perfection of the planes.

Fatigue and stresses caused by millions of revolutions in service sometimes produce dangerous internal weaknesses in airplane propellers. Periodically, therefore, every propeller is subjected to tests and inspection. The surface is etched with acid which reveals any minute cracks or other evidences of internal strain.

Stereoscopic Microscopes are used for examining these telltale clues—a another example of how microscopes aid in maintaining the health and safety of our fighting men.

* * *

Optical instruments are so vital to war and public health that the nation's needs absorb practically all of Spencer's greatly increased production.

* * *

Spencer LEN'S COMPANY
BUFFALO, NEW YORK
SCIENTIFIC INSTRUMENT DIVISION OF AMERICAN OPTICAL COMPANY