includes a new honey locust from Texas and eight new species of *Crataegus*. Mr. Theo. Holm contributes an 'Anatomical Study of *Eriocaulon decangulare* L.,' from which he concludes that this genus and its allies are somewhat unique among the monocotyledons. Mr. B. M. Duggar, of Cornell University, records the results of 'Physiological Studies with reference to the Germination of certain Fungous Spores.' The number closes with the usual book reviews, notes for students and news items.

THE February number of *Popular Astronomy* contains an article by R. G. Aitken, of Lick Observatory, on the 'Orbit of Sagittarii,' accompanied by a plate of the orbit; the second part of Mr. How's article on the 'Best Astronomical Books for the Use of Students' takes up historical and biographical works in detail; J. F. Lanneau contributes notes on the eclipse, and Asaph Hall a note on 'Clairaut's theorie de la figure de la terre.' J. K. Rees, of Columbia Universitory Observatory, presents a full report of the observations on the November meteors during the years 1898, 1899 and 1900. An abstract is also given of the article by Kretz on the 'Star Coma Berenices' and a full account of the recent reports of the Board of Visitors of the Naval Observatory. An article by Professor W. W. Campbell shows how the observations of Eros will determine the sun's distance from the earth and a résumé of the scientific progress of the nineteenth century closes the general department of the number. In addition to the usual notes a new department is opened which gives news of 'Double-Stars, their Observations and Observers.'

SOCIETIES AND ACADEMIES.

SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN.

THE December meeting of the Science Club of the University of Wisconsin was addressed by Dr. C. R. Van Hise on the topic, 'The Earth's Story of the Ore Deposits.' This address, which was delivered to a large audience, treated in a briefer and simpler manner a subject which has recently been given an exhaustive treatment in addresses before the American Institute of Mining Engineers and the Western Society of Engineers, and which under the title, 'Some Principles controlling the Deposition of Ores' has been printed in the *Transactions* of the first-mentioned Society. The thoroughness of Professor Van Hise's investigations, which, starting on different lines, have converged upon a common point, set to rest many hitherto controverted questions and, from an application of newly determined principles in the fields of physical chemistry, applied mathematics and soil physics, as well as in geology, there has been evolved a theory of ore deposition which is both logical and in accord with observed facts. The theory may be said to be grounded on two important earlier investigations: one by Van Hise, showing that at the moderate depth of 20,000 meters all save the smallest cavities must close in even the hardest rocks, whereas in most rocks they must close at one-half that depth, and one on Slichter's elaborate investigation of the flow of underground waters, an investigation which has been considerably extended by Van Hise.

From the first-mentioned study it follows that the circulating waters, which it is almost universally admitted deposit the ores from solution, could not have come from below the depth of 20,000 (or perhaps 10,000) meters. The excessive friction of liquids moving in capillary tubes, and the consideration that probably 100,000 times as much liquid as ore must be transported seem to exclude the possibility of ascensional currents below this level, thus restricting their circulation to the thin outer shell of the earth's crust—*the zone of fracture*. This requires that the circulating water shall be of meteoric origin, and the fundamental premise is made that the motion of the waters is a result of gravitative stress.

Water flowing under head from one point to another through a homogeneous medium will utilize the entire cross-section (indefinitely extended), though the major portion will pass by the shortest route. If vertical fissure planes exist in the course of the liquid the lines of flow will be deflected so that above a certain point they will enter the fissure in a downward direction and below another point they will be di-

rected upward, while between the two points they enter laterally. It follows from this that a particular body of ore may have been formed by ascending, descending or laterally moving currents, or by any or all combined.

The level of ground water separates an outer *belt of weathering*—a belt in which oxidation, carbonation and hydration are producing soluble bodies—from an underlying *belt of cementation* in which deposition is continually taking place, often in connection with solution. In many mining regions the processes of degradation have removed several thousand meters of rock from above the present belt of weathering, but as the belt removed has all at some time been included within the belt of weathering, it is an adequate storehouse from which the ore bodies of the present belt of cementation have been supplied. Another fundamental premise is that materials will be more generally taken into solution during the descending course of waters and be deposited during the upward course toward the surface, both because the increasing pressure and temperature with increasing depth favor solution, and because the larger fissures near the surface—the trunk channels—allow the mingling of solutions. Since the same fissure may near the surface be receiving descending waters, a little lower down laterally moving currents, and at still greater depth ascending currents, it follows that as degradation brings successively lower and lower belts within the realm of action of ground waters, the first concentration of ores will, in general, be produced by ascending currents and the later concentrations (if there be any) by laterally moving or descending currents. The first concentration should be less in amount than later concentrations, a conclusion which is supported by observation, since nine mines out of ten are poorer below the 300 meter level than above it, and still poorer below the 600 meter level. Inasmuch as the deep water circulation is deficient in oxygen but contains reducing agents, while the shallow water circulation contains free oxygen, it is easy to explain the development of oxide ores in the belts near the surface. Dr. Van Hise holds that oxidized salts, such as sulphates, carried to greater depths, react upon the lean sulphides so as to precipitate the metals as sulphides from the solution. The above are only the broader generalizations in the earth's story of the ore deposits as read by Professor Van Hise.

WM. H. HOBBS.

THE TEXAS ACADEMY OF SCIENCE.

DURING the quarter ending December 31, 1900, there have been three noteworthy meetings of this organization. At the first, held in the Chemical Lecture Room of the University of Texas, Friday evening, October 26th, Dr. Simonds, the retiring President of the Academy, introduced his successor, Henry Winston Harper, M.D., F.C.S., who then delivered the Presidential Address, his subject being 'Some Advances in our Knowledge of Immunity and Protective Inoculation.' This address will be published in full in SCIENCE.

The second meeting of the quarter was held in the Chemical Lecture Room of the University, Friday evening, November 23, 1900. The program was as follows:

1. 'The Present Foundation of the Austin Dam,' by Professor T. U. Taylor, University of Texas.
2. 'An Application of the 57.3 Rule,' by Professor T. U. Taylor.
3. 'Eros and the Solar Parallax,' by Dr. Harry Y. Benedict, University of Texas.

The third and last meeting was held at Baylor University, Waco, Texas, December 28–29, 1900. The program was of unusual interest and covered a wide range.

1. 'The problem of Forest Management in Texas,' by Dr. William L. Bray, University of Texas.
2. 'Recent Progress in Insect Warfare' (by title), by Professor F. W. Malley, Agr. and Mech. College of Texas.
3. 'The Value of Coal Tar Products as Practical Wood Preservers,' by Instructor E. P. Schoch, University of Texas.
4. 'A Mathematical Problem,' by Professor J. B. Johnson, Baylor University.
5. 'The Cretaceous—the Kindergarten of Paleontology,' by John K. Prather, B.S., Waco.
6. 'The Silt Problem in connection with Irrigation Storage Reservoirs,' by Professor J. C. Nagle, Agr. and Mech. College of Texas.
7. 'The Need of Technical Education in the South,' by Dr. William T. Mather, University of Texas.
8. 'The Modern Presentation of Botany,' by Instructor A. M. Ferguson, University of Texas.

9. 'Note on the Occurrence of Mammoth Remains in McLennan County,' by Professor O. C. Charlton, Baylor University.

10. 'The Hydrographic Survey of Texas,' by Professor T. U. Taylor, University of Texas.

11. 'Theorem concerning Centers of Curvature of a Roulette' (by title), by Dr. M. B. Porter, Yale University, New Haven, Conn.

12. 'On the Floral Provinces and Vegetative Formations of the West Texas Region' (by title), by Dr. William L. Bray, University of Texas.

FREDERIC W. SIMONDS,
UNIVERSITY OF TEXAS. *Secretary.*

ENGINEERING ASSOCIATION OF THE SOUTH.

THE regular monthly meeting of the Association was held on the evening of January 10th, at Vanderbilt University.

The death of Maj. Niles Meriwether, President of the Association was announced, and Messrs. J. S. Walker and Hunter McDonald were appointed a committee to prepare a memorial sketch of his life. The Association will feel most keenly this loss, for Maj. Meriwether has been a most active member.

A communication from Mr. J. C. Truatwine, Jr., Secretary of the 'Journal of Association of Engineering Societies,' was read. After some little discussion it was the unanimous opinion that the continuance of an individual publication was far preferable to uniting with the 'Journal of the Association of Engineering Societies,' and the Secretary was instructed to so notify Mr. Truatwine.

The first paper was a description of the methods of doing some bridge pier and foundation work in Chemulpo, Korea, by W. H. Holmes, an American engineer who has recently returned from that country. The system of keeping records of rivers in that ancient country was briefly described. They extended back into the past for many centuries and are said to be very accurate. Mr. Holmes stated that where an opportunity offered itself for a check the records were in every case sustained. The record for the river in question extended back 509 years and explanation was made at the beginning of the records that the history of the river previous to that time had been consumed in a fire which had burned the house and all contents.

The second paper was presented by Mr. Julian W. Kendrick, city engineer of Birmingham, Ala. It was an exhaustive study of the sewerage problem now confronting the Birmingham district. The geographical features of the drainage area were described, the difficulties in carrying out the various methods of sewerage set forth, and finally a plan proposed. The paper had been carefully prepared and was an interesting contribution on the sewerage question.

H. M. JONES,
Secretary.

VERMONT BOTANICAL CLUB.

AT the annual winter meeting of the Club on January 25th and 26th the following program was presented:

'The Finding of a Plumose Variety of *Asplenium ebeneum*,' by Mrs. Frances B. Horton.

'Some Common Confervæ,' by T. F. Hazen, Columbia University.

'Some Interesting Mosses Collected in Vermont in 1901,' by Dr. A. J. Grout, Boys' High School, Brooklyn.

'Are there Two Kinds of Hemlock in Vermont'? by Elroy C. Kent.

'Note on *Tremella mycetophila* Pk.,' by Dr. E. A. Burt, Middleburg College.

'Notes on the Last Season's Botanizing,' by Mrs. Nellie F. Flynn.

'Report of Progress on the Maple Sap Problem,' by A. B. Edson, University of Vermont.

'The Flora—What Next?' by Clifton D. Howe, University of Vermont.

'The Present Status of Vermont Botany,' by President Ezra Brainard, Middleburg College.

'A Botanical Trip to Joe's Pond,' by Mrs. Carrie E. Straw.

'Botanizing in the Bermudas,' by Dr. M. A. Howe, Columbia University.

'What Text-book of Botany shall be used in the High School?' by Miss Phoebe Towle.

'Wild Violets in the Garden,' by Miss E. Mabel Brownell.

'Are the Equisetums or Ferns Poisonous?' by Professor L. R. Jones, University of Vermont.

C. D. DIXLOWE,
Secretary.

DISCUSSION AND CORRESPONDENCE.

A BIBLIOGRAPHIC CATCH TITLE FOR EVER AND EVER.

PROFESSOR MARK'S method of referring to bibliographic lists by name of author and number of year is worthy of general adoption; but it is not surprising that a difficulty should be