

Sebastodes are viviparous, the young being developed internally and in multitudes, to be extruded when about two or three millimeters in length. The development of the young should indicate the phylogeny of the group. If the total number of vertebrae in *Sebastodes* is 24, we may infer with strong plausibility that *Scorpaena*, with its 24 vertebrae was the ancestral type. If the number is 31 we would grant this place to *Sebastes*. In either case, *Sebastodes* is intermediate.

Through the interest of Professor Edwin C. Starks, I have secured a number of young of a species of *Sebastodes* from Long Beach, California. These are very recently hatched, one to two millimeters in length. Vertebrae do not appear, but the muscular impressions which will correspond to them are 27 in number.

This agrees with the number of vertebrae in the adult of all the *Sebastodes* recorded. This test, therefore, fails to decide the question of origin, though it may be held to show that the separation of *Sebastodes* from *Sebastes* or from *Scorpaena* is really very old, and in spite of the strong resemblances of the forms concerned.

I may further note that all allies of *Scorpaena* with 24 vertebrae have 12 spines in the dorsal fin, *Sebastodes*, and its relatives with 27 vertebrae have 13, and *Sebastes*, with 30 or 31 vertebrae, has 15 or 16 dorsal spines, the numbers of fin rays corresponding in a degree to the number of vertebral segments.

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Since the above was in type, I have obtained from the diatomaceous shales of the Puente formation (Miocene) of Orange, California (E. E. Hadley coll.), a fossil fish apparently of the *Sebastodes* group. This specimen has the vertebrae about 32 in number, 10 + 20 being preserved. The head of the specimen is lost, but the fish must belong to the *Sebastinae*, as no other forms unite the characters of stiff dorsal spines, anal rays III, 10, with small scales and the vertebrae more than 24. In other respects, this new genus (soon to be described and figured), seems nearest *Sebastosomus* Gill (*S. mystinus*). The

discovery of this form is again not decisive, though it indicates the possibly primitive character of the *Sebastina* fishes having the larger numbers of vertebrae.

DAVID STARR JORDAN

THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

THE fourth annual meeting of the American Association of Petroleum Geologists was held at the Adolphus Hotel, Dallas, Texas, on the 13 to the 15 of March. More than two hundred petroleum geologists and a great number of visitors were present from all portions of the United States, the association being especially honored by the presence of David White, chief geologist of the U. S. Geological Survey; I. C. White, state geologist of West Virginia; Ralph Arnold, valuation expert of the Internal Revenue Department of the U. S. Treasury, and Professor Chas. Schuchert, of Yale University.

The opening meeting of the association was called to order on Thursday morning by the president, Alexander Deussen. Gilbert H. Irish, of the Dallas Chamber of Commerce, delivered an address welcoming the geologists to Dallas. Short talks were made by Dr. David White, Dr. I. C. White; Dr. J. A. Udden, state geologist of Texas; W. F. Cummins; J. A. Taff, of San Francisco, and Leo Hager, of Houston.

The first technical session was held Thursday afternoon, attention being devoted to the geology of the oil producing districts of north central Texas. John A. Udden, chief geologist of the Sinclair Oil Company, read a paper dealing with the subsurface geology of the oil-producing districts of north central Texas, and accompanied his paper by a set of well samples and slides of the formations penetrated in some of the wells of north central Texas. Chas. R. Eckes, chief geologist of the Texas Company, gave a description of cuttings from the Duffer well of the Texas Company at Ranger, and displayed a set of samples from this well. F. B. Plummer, of the Roxana Petroleum Company, gave a description of the cuttings from the Goode well of the Roxana Company, in Young County, and the Dye well in Palo Pinto County. Wallace E. Pratt, chief geologist of the Humble Oil & Refining Company, read a paper entitled "Notes on structure of surface rocks as related to subsurface structure and petroleum accumulation in north Texas." Dr. David White read a paper by G. H. Girty, on the "Bend formation and its

correlation." Dr. Girty pointed out that the lower part of the Bend Series of the Bend shale proper belonged to the Mississippian, and the upper part of the Bend, including the Marble Falls limestone and the Smithwick shale, belonged in the Pennsylvanian, with an unconformity between the Bend shale and the Marble Falls limestone.

At 8:15 in the evening a popular meeting was held in the auditorium of Municipal Building, Dr. I. C. White presiding. A large contingent of townspeople were in attendance. The session was addressed by Dr. David White, who made a plea for the accumulation of petroleum reserves in foreign countries by the American companies so that the future of the American oil industry would be assured. Dr. J. A. Udden read a paper on oil-bearing formations in Texas, and Mr. M. L. Fuller, chief geologist of the Sun Company, delivered an illustrated lecture on China.

On Friday morning papers were read by Dr. J. W. Beede, of the bureau of economic geology of the University of Texas, on "Notes on the structures and oil showings in the Red Rocks of Coke County, Texas," by J. A. Udden, on "Observations on two deep borings on the Balcones Faults," and by M. L. Fuller, "On the water problems of the Bend series, and its effect on the future production and flooding of oil sands." T. W. Gregory, of the U. S. Fuel Administration, read a paper on "Gas conservation and distribution under the U. S. Fuel Administration."

On Friday afternoon papers were read by W. L. Matteson, giving "A review of developments in the central Texas oil fields," one by Walter R. Berger, of the Empire Gas & Fuel Company, on the "Extent and interpretation of the Hogshooter Gas Sand," a paper by Dr. Raymond B. Moore, state geologist of Kansas, on the "Correlation of the Bend." Dr. Moore's conclusions were different from those of Dr. Girty's, the collections made by Dr. Moore, for the Roxana Petroleum Company, indicating that the lower Bend, or the Bend shale proper, belongs to the Pennsylvania instead of the Mississippian. Sidney Powers read a paper on the "Geologic work of the American Expeditionary Forces." The afternoon session was concluded by a paper by Dr. Ed. Bloesch, on "Unconformities in Oklahoma."

Friday evening a banquet was tendered the association and the oil producers by the Dallas Chamber of Commerce & Manufacturer's Association in the junior ball room of the Adolphus Hotel. The meeting was addressed by Ralph Arnold, who out-

lined the policy of the federal government in the matter of valuation and taxation of oil properties. Mr. Arnold's address was followed by two minute talks by F. W. Shaw, David White, Chester Washburne, Judge Greer, attorney for the Magnolia Company, J. Edgar Pew, vice-president of the Sun Company, and others.

Saturday morning was devoted to a symposium on valuation methods, Dr. I. C. White presiding. Papers were read by Ralph Arnold on "Problems of oil lease valuation," by Carl H. Beall on "Factors in the valuation of oil lands," by Professor Roswell H. Johnson on "Decline curve methods," and by E. W. Shaw, of the U. S. Geological Survey, on "Valuation of gas properties."

Saturday afternoon a paper was read by Mr. E. H. Sellards, of the bureau of economic geology, University of Texas, on "Structural conditions in the oil fields of Bexar County, Texas." Dr. Schuchert gave an illustrated lecture on contacts, and Professor Roswell H. Johnson presented a "Statistical investigation of the influence of structure on oil and gas production in the Osage Nations."

The following papers were read by title:

D. F. MacDonald, "Notes on the stratigraphy of Panama and Costa Rica."

Geo. E. Burton, "Design for a log meter."

G. Sherburne Rogers, "Oil field waters."

J. W. Bostick, "The Saratoga, Texas, oil field."

Earl A. Trager, "Laboratory methods for the examination of well cuttings."

Robert T. Hill, "History of geologic exploration in the southwest."

After the reading of these papers, the business meeting of the association was held, and the following officers were elected for the coming year:

Dr. I. C. White, *President*.

Irving Perrine, of Hutchinson, Kansas, *Vice-president*.

Professor C. E. Decker, University of Oklahoma, *Secretary-Treasurer*.

Chas. H. Taylor, *Editor*.

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