thereafter increasing slowly and gradually towards the bottom.[3]

The absolute values show a great difference between the stations; the Atlantic minimum lies between 40 and 50 per cent., whereas the Pacific is close on 0; *i.e.*, at depths between 400 and 500 m, the water here *contains practically no oxygen at all.* We found the same thing at all the *Dana* stations in the Pacific off Panama.

The various deep sea expeditions, from the *Challenger* onwards, which have investigated the quantity of oxygen in the ocean, found similar conditions to those at our Station 1,202 in the Caribbean Sea, with minimum values varying somewhat with the latitude; higher at a distance from and lower near to the equator.

As far as I am aware, however, there is no previous instance on record of the finding of such low values in the open sea as those noted by the *Dana* off Panama in January, 1922.

In partly enclosed basins, such as the Black Sea, for instance, and certain parts of the Baltic, there may, it is true, be a lack of oxygen deep down, as in the case of our *Thor* station 172 in the Black Sea, 1910, where the quantity of oxygen diminished, from saturation at the surface, to only 2.4 per cent. at 150 m depth, and reached 0 at about 200 m. But as shown by the Black Sea curve in the figure here given, there is a shortage of oxygen here from barely 200 m right to the bottom, showing that we have an entirely different type to deal with here in the enclosed Black Sea. It is precisely the characteristic feature of the open sea that the oxygen content, after falling to an intermediate minimum, again increases towards the bottom, as both the Caribbean and the Pacific stations show.

The operations of the *Dana* in the Pacific did not extend far enough outside the Gulf of Panama to afford further information as to the cause of this remarkable shortage of oxygen. Generally speaking, it must be a case of "old" or stale water, *i.e.*, water which has not been in contact with the atmosphere for a long time; its origin, however, I am unable to determine. Another cause of the oxygen shortage is undoubtedly to be found in the wealth of animal life in the intermediate and deeper water layers at these Pacific Stations, as this would of course consume a great deal of oxygen. After working for a long time in the Atlantic, we were surprised at the great quantities of bathypelagic animal forms brought up by our nets on the Pacific side of Panama. And our astonishment was not lessened on learning how small was the amount of oxygen in the water of these deeper layers.

I give here the quantities of plankton in our horizontal hauls at stations 1,205 and 1,202 for those depths at which the same implements were used from both stations, so as to permit comparison of the yield. It should be noted that the depth at which the net actually fished answers roughly to half the length of wire paid out.

Meters of wire out.	Quantity of plankton (ccm).	
	St. 1,205.	St. 1,202.
50	100	350
100	900	250
300	1,000	250
600	1,000	100

At some of the other Pacific stations, the quantity of plankton in the neighborhood of the surface was considerably greater than at station 1,205.

It would, of course, be quite incorrect to conclude, from the above figures, that the paucity of oxygen at the Pacific station (1,205) is the cause of its richer bathypelagic fauna, as compared with the Caribbean station. But the *Dana* stations off Panama undoubtedly show that a wealth of bathypelagic animal life can exist in waters of a lower oxygen content than we had reason to suppose.

It would be very interesting to investigate, by means of large vertical closing nets, the quantity of plankton in that portion of the column of water where the oxygen minimum is situated; the brief stay of the *Dana* on the other side of Panama, however, did not permit of this.

JOHS SCHMIDT

CARLSBERG LABORATORY
COPENHAGEN, DENMARK

[3] To between 30 and 40 per cent. at about 3,000 m depth at St. 1,205.

THE PENNSYLVANIA ACADEMY OF SCIENCE

THE Pennsylvania Academy of Science held its second annual meeting at Harrisburg, Pennsylvania, April 10 and 11. The morning of April 10 was given over to meetings of committees. In the afternoon the president, Dr. O. E. Jennings, of the University of Pittsburgh, gave his address, after which and on the morning of April 11 the following papers were presented:

Sporobolus uniflorus Muhl. in Pennsylvania: E. M. GRESS.

Demonstration of the life history of the earthworm: S. HOFFMAN DERICKSON.

A double turtle of the genus Chrysemys: S. HOFFMAN DERICKSON and V. EARL LIGHT.

Observations on hydra in limestone springs during the winter months: RAY A. TROUTMAN.

Weather conditions at total eclipses of the sun predictable; also notes on the corona: JOHN H. WAYMAN.

Geographic origin and distribution of the increase of negro population in Pennsylvania: DEAN DUTCHER.

Problems concerning the formation of calcareous concretions in streams: H. JUSTIN RODDY.

An unusual case of limestone decomposition: BENJ. L. MILLER.

The energy of high velocity electrons and the variation of their mass with speed: MARSH W. WHITE and W. R. HAM.

Finance and statistic courses administered by the departments of mathematics of Pennsylvania colleges and universities: H. S. EVERETT.

A study of helicoids and helices by vectors: JOSEPH B. REYNOLDS.

Fossil ivory: R. W. STONE.

Observations on peach yellows: W. A. MCCUBBIN and F. L. HOLDRIDGE.

Aphids in the transmission of raspberry mosaic: FLOYD F. SMITH.

The esthetic value of Pennsylvania game birds: GEO. M. SMITH.

A new field of educational research; A possible effect and determination of the earth's rotation; The extent of the Ortho and Parhelium schemes: RICHARD HAVNER.

At the business session a permanent constitution was adopted and the following officers were elected: *President,* B. L. Miller, Lehigh University; *Vice-president,* H. D. Fish, University of Pittsburgh; *Secretary,* T. L. Guyton, State Department of Agriculture; *Assistant Secretary,* F. L. Maxfield, State Department of Education; *Treasurer,* F. D. Kern, Penna. State College; *Editor,* Geo. H. Ashley, State Department of Forest and Waters; *Executive Committee:* N. H. Stewart, Bucknell University; S. H. Derickson, Lebanon Valley College.

T. L. GUYTON,
Secretary.

HARRISBURG, PA.

UTAH ACADEMY OF SCIENCES

THE eighteenth annual meeting of the Utah Academy of Sciences was held at the University of Utah, April 3 and 4, 1925.

The following officers were elected: *President,* Professor Harold R. Hagan, University of Utah, Salt Lake City; *first vice-president,* Dr. Thomas L. Martin, Brigham Young University, Provo; *second vice-president,* Mr. R. A. Hart, drainage engineer, Salt Lake City; *council,* Dr. Willard Gardner, Utah Agricultural College, Logan; Dr. Bert L. Richards, Utah Agricultural College, Logan; Mr. J. Cecil Alter, U. S. Weather Bureau, Salt Lake City; *permanent secretary,* Mr. C. Arthur Smith, East High School, Salt Lake City.

Dr. Murray O. Hayes, geologist, and Professor Clawson Y. Cannon, of the Brigham Young University, were elected fellows of the academy.

There was a material increase in the membership of the academy by the addition of a number of new members; however, this was offset by the loss of other members due to removal from the state and other causes. The removals are: Dr. W. E. Carroll, Utah Agricultural College, becomes professor of animal husbandry at the University of Illinois; Mr. D. A. Shoemaker, of the U. S. Forest Service, transferred to Washington, D. C.; J. G. Olsen, assistant state bacteriologist and professor of bacteriology at the University of Utah, becomes professor of bacteriology at the University of Illinois; M. M. Justin, U. S. Bureau of Crop Estimates, transferred to a similar position in Indianapolis, Indiana.

The program was of unusual strength and interest and consisted of the following papers:

President's address.

Structural relief in the Wasatch faulting system: WILLIAM PETERSON.

Flood and gravel control works: L. M. WINSOR.

Educational fundamentals: H. T. PLUMB.[1]

Harvesting losses: AARON F. BRACKEN.

Protein requirements for dairy cows: C. Y. CANNON.

Watershed protection in Utah: F. S. BAKER.

The leaching of heavy saline soil: KARL HARRIS.

Secular trend in precipitation data: WILLARD GARDNER.

The effect of heat treatment of milks on their curd characteristics: R. L. HILL.

Scientific discoveries regarding the thyroid gland: HEBER J. SEARS.

Thirteen-year-old worms in the human body: NEWTON MILLER.

The iron, chlorine and sulphur content of grains, and the influence of irrigation water upon the same: J. E. GREAVES.

Some social and economic phases in the village of Escalante in Utah: LAWREY NELSON.

The efficiency of the Brighton snow survey: J. CECIL ALTER.

Glaciation on the west side of Mt. Timpanogos: MURRAY O. HAYES.

The nature of the forces causing the rise of water in plants: LEON B. LINFORD.

The vapor pressure of soil as influenced by soil structure: M. D. THOMAS.

Some experiments on flotation: J. F. GATES and L. K. JACOBSON.

Anomalous behavior of sodium sulfite on being oxidized with free oxygen: C. E. MAW.

C. ARTHUR SMITH,
Secretary

[1] Mr. Plumb was the invited guest at the convention and his address was a leading feature of the program.