precautions, they can not be constructed for smaller amounts of solution. This can be accomplished, not by a smaller model of the same shape, but by making the bottom of the electrode vessel more conical in shape and taking particular precautions in sealing the electrode as near the base of the vessel as is conveniently possible. It is not desirable to materially decrease the diameter of the upper portion of the electrode vessel, because in so doing, the bubbling process is seriously interfered with.

CONSTRUCTION AND OPERATION

The electrode vessel *E* was made by sealing a short piece of glass tubing to an ordinary three inch soda-lime tube. The glass tube was then bent into position to make the side arm, *A*. The electrode proper, which consists of a piece of platinum foil, was sealed as near the base of the main vessel as possible. The protruding end of the foil was bent into a loop and partially embedded in sealing wax to give added mechanical strength. The rubber stopper, *D*, is used to prevent the rapid diffusion of air into the electrode vessel. The support, *S*, shown in the diagram by means of dotted lines, was made from a No. 12, two-holed rubber stopper by cutting out the portion between the holes.

After platinization of the electrode, about 1.5 c.c. of the solution to be tested are put into the electrode vessel, *E*. Purified hydrogen is bubbled through the solution by way of the side arm, *A*. Usually, about three minutes of bubbling are required for saturation.

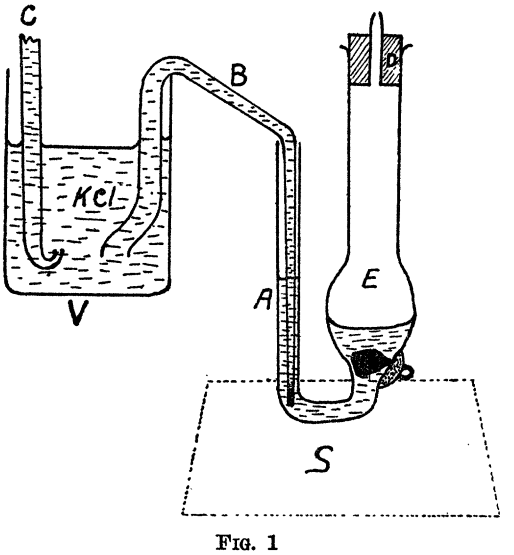

FIG. 1

The diagram shows the electrode in position for a measurement. *C* represents the side arm of the calomel electrode, *V*, a vessel containing a saturated KCl solution, and *B*, a tube filled with saturated KCl and plugged at the smaller end with filter paper to prevent the too rapid siphoning of KCl from *V*.

When properly constructed, this electrode possesses the following features, which should make it applicable for quite general use:

1. Simplicity of construction.
2. Ease of operation.
3. Requires only a very small amount of solution for a determination.

J. ROY HAAG
PENNSYLVANIA STATE COLLEGE

THE OKLAHOMA ACADEMY OF SCIENCE

THE tenth annual meeting was held in Oklahoma City, on February 10, and at the University of Oklahoma, Norman, on February 11, 1922. The following papers were read:

FEBRUARY 10

Presidential address: *The possibility of the redemption of the Great Plains from its semi-arid condition*: J. B. THOBURN.

Some notes on the Bois Fort Chippewa of Minnesota: ALBERT B. REAGAN.

Identification of Anthoceros in the Oklahoma cryptogamic flora: M. M. WICKHAM.

Notes on the migration of Macrochelys lacertine: M. M. WICKHAM.

Further notes on migration of Terrapene carolina in Oklahoma: M. M. WICKHAM.

Identification of fresh water sponges in the Oklahoma fauna: M. M. WICKHAM.

Red and white blood corpuscles and catalase in the blood of non-complement guinea pigs: L. B. NICE, A. J. NEILL and H. D. MOORE.

The regular tetrahedron in relation to its cube and other solids: OSCAR INGOLD.

Oklahoma geography in the high schools: C. J. BOLLINGER.

The poisonous substance in cotton seed: PAUL MENAUL.

The chemistry of the pecan: W. G. FRIEDEMANN.

FEBRUARY 11

Zoology Lecture Room, State University.

Biology Section

The egg-laying habits and early development of Haminea virescens (Sby.): A. RICHARDS.

The acceleration of the cleavage rate of Haminea virescens (Sby.): A. RICHARDS.

A third Christmas bird Census: MARGARET M. NICE.

Fate of leucocytes in the placental circulation: I. What prevents leucocytes of the maternal circulation from migrating into the fœtal circulation? II. The rôle of the syncytial layer of the chorionic villi. III. Importance of this investigation relative to inheritance of disease or immunity from disease: JOS. M. THURINGER.

A new differential staining method for connective tissue combined with the ordinary hematoxylin-eosin stain (Demonstration): JOS. M. THURINGER.

Effect of lime and organic matter on the root development and the yield of alfalfa on the so-called hard-pan subsoils of Oklahoma: M. A. BEESON.

Notes on the parasite fauna: JOHN E. GUBERLET.

A preliminary note on the optic tract of eyeless flies: MILDRED H. RICHARDS and ESTHER Y. FURROW.

Mitotic index of the chick: AUDREY FLITCH SHULTZ.

Somatic mutations and elytral mosaics in Bruchus: J. K. BREITENBECKER.

A preliminary report on the genetics of a red spotted sex limited mutation in Bruchus: C. LEE FURROW.

A preliminary note on the chromosome number in the spermatacite of Bruchus: FRANK G. BROOKS.

The grand period of growth of root-hairs (Lantern): R. E. JEFFS.

Continuous culture of oats versus rotation: H. S. MURPHY.

Multiple adenomata of the kidney cortex with special reference to histogenesis: JULIA STEELE ELEY.

SATURDAY, FEBRUARY 11, 9:30 A.M.

Geology Section

Physiographic history of the Arbuckle Mountains: S. WEIDMAN.

Some observations of erosion and transportation in the Wichita Mountain area: OREN F. EVANS.

Subsurface studies: R. D. REED.

An Oklahoma meteorite: A. C. SHEAD.

Robberson oil field: LEON ENGLISH. Discussion by ROGER DENNISON and ARTHUR MEYER.

Percentage of square mile of oil production in Oklahoma: BESS M. MILLS.

Oklahoma oil resources: C. W. SHANNON.

A new variant of the hidden treasure myth: C. H. GOULD.

The Webber's Falls limestone: J. B. THOBURN.

AFTERNOON SESSION, 1:15 P.M., SATURDAY, FEBRUARY 11

Room 308, Geology Building.

Sykes Alaskan expedition of the University of Oklahoma of 1921: ED. CRABB.

A note on the economic status of the bald eagle in Alaska: ED. CRABB.

On the intensity of the sound as measured by Rayleigh disc or a Webster phonometer: J. H. CLOUD (Read by title).

The simple rigidity of a drawn tungsten wire at incandescent temperature: WM. SCHRIEVER.

Economics and Government

International exchange: A. B. ADAMS.

Responsibility in state government: F. F. BLACHLY.

Public health administration in Oklahoma: MIRIAM OATMAN-BLACHLY.

Psychology

Self-taught arithmetic from the age of five to seven and a half: SOPHIE R. A. COURT.

Further notes on eighteen-months vocabularies: MIRIAM OATMAN-BLACHLY.

A child that would not talk: MARGARET M. NICE.

The following resolutions were adopted:

1. WHEREAS, It is to the best interest of the American people to have research in all branches of science proceed unhampered, the Oklahoma Academy of Science places itself on record against the provision in the Fordney tariff bill now pending in the United States Senate which puts a tariff on books, magazines and scientific apparatus.

2. WHEREAS, It is highly desirable to conserve the natural resources of our state, the Oklahoma Academy of Science places itself on record favoring the work of the Oklahoma State Forestry Association.

The following officers were elected for the ensuing year:

President: R. O. Whitenton, Stillwater.

First Vice-president: S. Weidman, Norman.

Second Vice-president: W. G. Friedemann, Stillwater.

Secretary: L. B. Nice, Norman.

Treasurer: H. C. Roys, Norman.

Curator: Fred Bullard, Norman.

L. B. NICE,
Secretary.

NORMAN, OKLAHOMA