Celebrating 100 Years of Microscopical Magnification

The Leidy Letter

Newsletter of The Leidy Microscopical Society
Volume 1 March 2025 Number 3

Editor's Note:

Last month's Leidy Letter featured an article on Joseph Zentmayer. Mention was made of his most notable microscopes, the Grand American and the American Centennial. The American Centennial is considered by many the finest and most influential American microscope manufactured in the 19th century. Joseph Zentmayer was awarded a medal at the 1876 Centennial Exhibition, Philadelphia, PA for his American Centennial microscope.

I thought it would be fitting to bring attention to Zentmayer's American Centennial microscope (which the Leidy Microscopical Society has several in their possession), as the Leidy Microscopical Society celebrates our 100th Anniversary. Therefore, please see the articles reprinted from **The Microscopist: A Manual of Microscopy and Compendium of the Microscopic Sciences** by Joseph Henry Wythe, AM, MD

Continued on page 2

2025 Officers of the Leidy Microscopical Society

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Meetings of The Leidy Microscopical Society are held at the

The Community Center at GIANT
315 York Road
Willow Grove, PA 19090

On the third Wednesday evening from 6:00 PM to 8:30 PM in September, October, March, April, May & June and the third Saturday from 10:00 AM to 1:00 PM in November, December, January & February.

The Annual Leidy Microscopical Society Micromount Symposium is held in March.

1877 on the Grand American microscope and the description of the American Centennial by J. Edwards Smith, M.D. in his 1880 book **How to See with The Microscope** along with a paper by Joseph Zentmayer as read before the Biological and Microscopical Section of the Academy of Natural Sciences, Philadelphia, June 4th, 1877, and titled **WHAT I KNOW ABOUT LATE IMPROVEMENTS OF THE MICROSCOPE.** Please note I could not find the figures for the W. H. Bulloch microscope or the Bausch & Lomb Optical Company Gundlach microscope that are mentioned in the article. However, I believe the diagrams provided are reasonable representations.

Additionally, at the January meeting, Karenne Snow mentioned an article in the March-April 2005 issue of the Mineralogical Record magazine, that was written by Quintin Wight, about a device to make sealing circles on microscope slides that is in the position of the Leidy Microscopical Society. I came across an article in an old Popular Science magazine on how to make such a device. That article is found later in this newsletter.

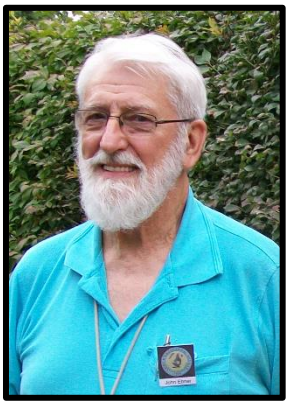
Finally, I was informed by Wayne Geller that he as the one who shot the video of Leonard Morgan on his VHS-C camera back in 2000. Thank you, Wayne, for taking the initiative and foresight to preserve the moment for future generations.

Program for March 19, 2025

The March 19, 2025, meeting of the Leidy Microscopical Society will feature "A Treasure Obtained at the 49th Annual Leidy Microscopical Society Micromount Symposium". Additionally, those who are present will critique the symposium on how to make improvements. Members and guests are requested to share their treasure for discussion and viewing. Everyone is invited even if you do not have a microscope. PLEASE NOTE: WE ARE NOW INTO OUR WEDNESDAY EVENING SCHEDULE UNTIL NEXT NOVEMBER. THE MEETINGS WILL START AT 6:30 PM. HOWEVER, YOU CAN ARRIVE EARLIER TO GET YOUR MICROSCOPE SET UP.

The Curator

By Eric Brosius



John Ebner (1931-)

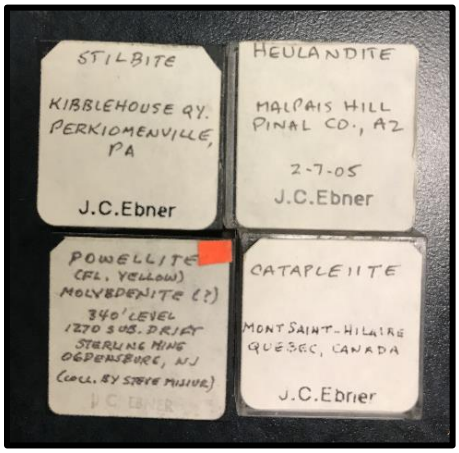
The word curator comes from the Latin: cura, meaning to take care!

Meriam Webster's Collegiate Dictionary defines curator as, '*one who has the care and superintendence of something: especially one in charge of a museum, zoo or other place of exhibit.*'

The February meeting of the Leidy Microscopical Society featured micromounts of John Ebner. Unfortunately, only a few of those present have micromounts, in their collections, made by John Ebner. In fact, of the nine members present there were only a total of 18 mounts. Bill Prince's mount of Boltwoodite

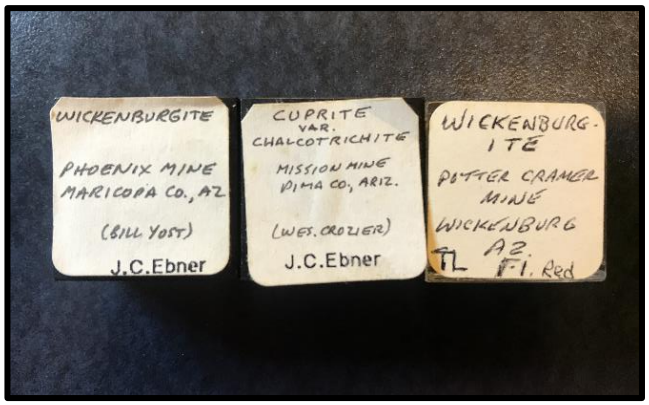
Continued on page 3

on calcite from the New Method Mine, Amboy, San Bernadino County, California was voted the best mount among the eighteen.



John Ebner Micromounts
from the John Ferrante Collection

John Ebner Micromounts
from the Bill Prince Collection



John Ebner Micromounts
from the Karenne Snow Collection

John Ebner Micromounts
from the Don McAlarnen Collection

Eighteen micromounts is a miniscule number compared to the total number of micromounts in John Ebner's collection. When John was inducted into the "Micromounters Hall of Fame" in 1997, his collection exceeded 25,000 micromounts with over 2000 species that represented over 900 micromounters from the 1850's to 1997. The amount of micromounts currently in his collection is reported to be well over 50,000.

John can be considered the curator of curators for micromounts. The entire collection is in his private museum known as the Micromount Hall of Fame Museum and is the most comprehensive micromount collection in the world. Those who desire to view the collection should contact John directly.

Continued on page 4

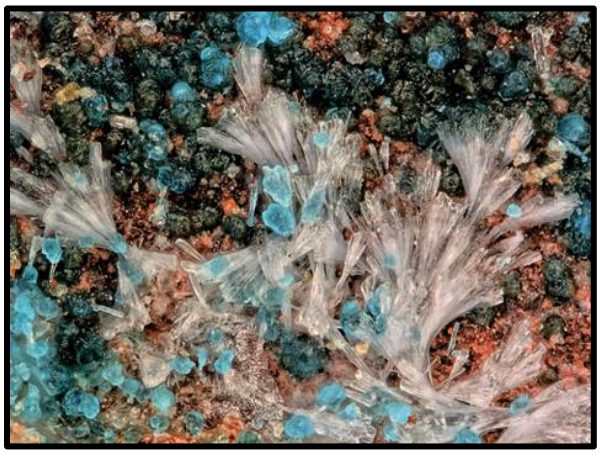
Just a few of the historical items in John Ebner's Micromount Hall of Fame Museum

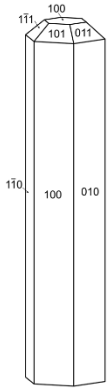
John started collecting minerals of all sizes at the age of 38 from 1969 to 1981. At that point, he viewed the Paul Seel exhibit of antique micromounts and microscopes at the Baltimore Micromount Symposium and instantly became enamored with all things micromount. Specifically, those of historical significance.

Paul and Hilde Seel, Bill Hunt, Bill Pinch and Dick Hauck started John's collection with gifts of numerous mounts. It wasn't long before his collection grew to include artifacts, microscopes, photos, plaques, molds for making labels and other things all related to micromounting. He concentrated his collection on mounts from micromounters who have minerals named after them or the type locality where the mineral was were first described.

In 2023 john was honored by having the mineral Ebnerite named after him. This colorless zinc ammonium phosphate $[NH_4)Zn(PO_4)]$ with a vitreous luster, hardness of 2 on Moh's scale, Specific Gravity of 2.78 and hexagonal crystal structure was found in bat guano-related, post mining secondary minerals from the 125 foot level of the Rowley Mine, Theba, Painted Rock Mining District, Painted Rock Mountains, Maricopa County, Arizona.

Continued on page 5





Above Left: Sprays of ebnerite crystal with blue balls of sampleite.
(Specimen #76275; Field of view 1.1 mm across).
Above Right: Crystal drawing of ebnerite; clinographic projection in standard orientation.
The drawing was created using SHAPE, version 7.4 (Shape Software, Kingsport, Tennessee, USA).
Courtesy of Mineralogical Magazine (2024), 88, 312–318, Cambridge University Press

John is a regular exhibitor and attendee of Micromount Symposia worldwide. He has held numerous positions in multiple organizations and a member of many more including the Leidy Microscopical Society.

In Other Society Business

There were nine members (John Ferrante, Paul Langer, Bill Prince, Len Porcelli, Karenne Snow, Don McAlarnen, Christel Hoffmann, Dick Braun, Eric Brosius) in person attending the February 15, 2025, meeting. One Member (Robert Carlton) joined the meeting via the Zoom on-line application.

A motion was made to correct last month's motion in purchasing tables revising the purchase from 4 to 8 tables for use in the upcoming and future Micromount Symposium. The motion was approved by those members in attendance. The cost for the 8 tables was about $41.00 apiece. They are now part of the Society's assets.

A motion was made to allow the NorthEast Regional Fluoresophile (NERF) Chapter of the Fluorescent Mineral Society to store the four show tubs, that house the tablecloths and extension cords, in the Leidy Microscopical Society's storage locker for free in exchange for the use of the tablecloths and extension cords for the Micromount Symposium. The motion was approved by those in attendance.

Set up for the Micromount Symposium at the Advent Lutheran Church, Richboro, PA is scheduled for March 7, 2025, at 2:00 PM. All volunteers are welcome.

Continued on page 6

A plea for volunteers to speak on the history of the Leidy Microscopical Society on Friday March 8, 2025, Micromount Symposium to celebrate the 100th anniversary of the Leidy Microscopical Society was made. John Ferrante indicated he will provide the Dr. Rilling 3-D slides of the Keeley Collection micromounts along with the viewers needed to view the slides to anyone at the Micromount Symposium.

Robert Carlton is still in the planning stages of a joint meeting with the Philadelphia Microscopy Society to be held at the Delaware County Institute of Science.

An update on the George Butler Estate Mineral Auction through the Alderfer Auction House was given by Don McAlarnen. The bids taken on many of the Paul Seel micromounts, that were in groups of 10 mounts, and other minerals were being sold at very high prices. There are many more auctions being planned for the future so visit the Alderfer Auction House website frequently.

The Eastern Federation of Lapidary and Mineral Societies (EFMLS) dues are due. None of the Society's officers have received the normal on-line notification from the EFMLS. Treasures Don McAlarnen will reach out to the EFMLS to bring the Leidy Society up to date with our obligation.

Conformation was made for the upcoming meetings. The meetings are scheduled for March 19, April 16, May 14, and June 18 all at 6:30 PM at the Giant Community Center, Willow Grove, PA. There is some discrepancy over the May 14 date which might be switched to May 21 if a room is available at the Giant Community Center. Please check the newsletter on the May meeting's date.

The Society's storage locker cost was recently increased to $39.00/month for all existing renters. Treasure McAlarnen suggested we close our existing lease, as we were only obligated for one year, and open a new lease in a different storage locker for the new lease amount of $14.00/month, at the same time. He will investigate this and keep the group informed of the situation.

Quintin Wight informed the Leidy Microscopical Society via email of the upcoming 61st Micromount Symposium of the Canadian Micro Mineral Association on May 2-4, 2025, at Brock University, St. Catharines, Ontario. Registration forms and information are available online.

Paul Langer offered a crystal chart for free to any attendee at the meeting.

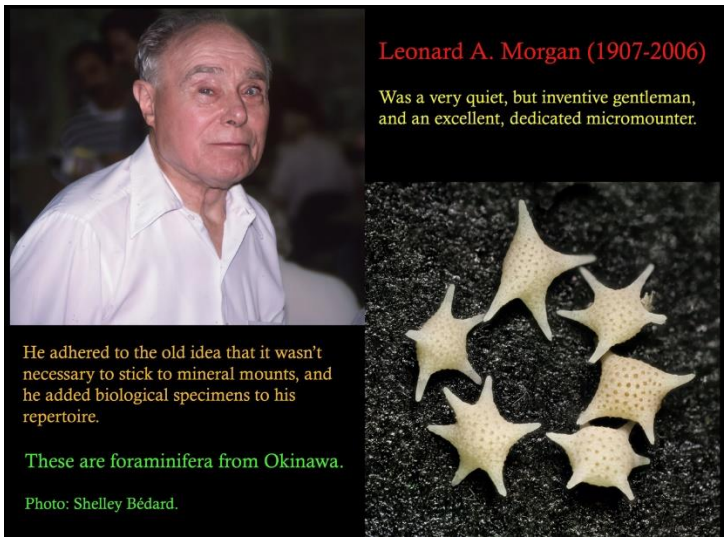
John Ferrante shared Randy Rothchild micromounts from his collection for viewing during the meeting.

Eric Brosius had a selection of an old field miniature filed microscope and a new Carson miniature field microscope on display.

Continued on page 7

Quintin Wight sent the following email and picture of a Leonard Morgan mount he was given by Leonard Morgan. The photo was taken by Quintin's daughter, Shelly Bedard

Speaking of Leonard Morgan once more, the attached is a copy of one of the slides from my talk Theorie and Practyse of Micromounting (the title is a bit of a spoof). That's one of the Len M. mounts in my collection. He was really good at this sort of thing. As I recall, he just came by my scope at Baltimore, laid the mount at my side, and walked away. He never said anything.
Cheers,
Quintin



The program for the March 19 meeting will be a "Treasure that was obtained at the March 8-9, 2025, Leidy Microscopical Society Micromount Symposium" along with a critique of the symposium. Members and guests are requested to share their treasure with the group.

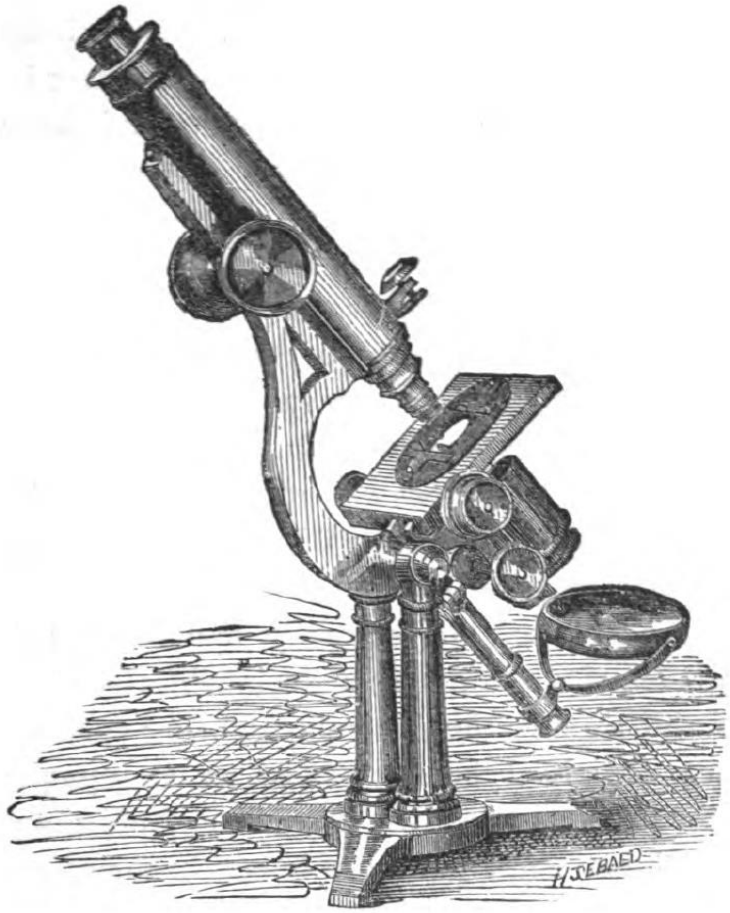
The Zentmayer Grand American & American Centennial Microscopes

From: **The Handbook of Medical Microscopy**, By Joseph G. Richardson, M.D., Microscopist to the Pennsylvania Hospital, 1871, J.B. Lippencott & Co., Page 18-21

Members of the fortunate class on which the *res angusta domi* does not press, can, of course, when purchasing a microscope, choose their instrument of almost any variety of perfection and price, up to Powell & Lealand's No. 1, Large Compound Microscope, with Binocular Arrangement , costing, complete, £ 189 , or near $ 1800 in this country; yet as few such purchasers will procure instruments without comparing those of different manufacturers, not only personally, but with the aid of their numerous friends, it seems unnecessary to describe here many different master-pieces of mechanism all so perfect as to make the selection of any one a difficult problem. As a representative of American workmanship, Zentmayer's Grand Microscope ranks high, and has received from Dr. F. A. P. Barnard, President of Columbia College, N. Y., as Commissioner of the

Continued on page 8

United States to the Exposition Universelle, Paris, 1867, the flattering encomium that "nothing could be more tasteful or elegant than the first-class stands constructed by Zentmayer." This excellent instrument stands nineteen inches high, and is supported upon a tripod base, whose feet diverge sufficiently to insure complete firmness and stability. The two brass pillars, upon which the body and stage are swung, rest upon a revolving plate, with a graduated edge, by which the angular aperture of the objectives may be ascertained. The body is moved by a double milled head, pinion, and rack for the coarse arrangement, and a fine micrometer screw for the delicate adjustment. The mechanical stage has a screw adjustment, with milled head, for the horizontal motion, and a delicate chain and pinion, with milled head, for the vertical motion. On the center of the upper side of the stage a circular plate, with a graduated edge, is attached for measuring angles of crystals. The whole thickness of the stage is but 3/16 of an inch, but it is, nevertheless, perfectly solid and steady, and affords unusual facility for great obliquity of illumination when difficult tests are to be resolved. Under the stage a small tube, with rack and pinion, is attached, in which the accessory illuminating apparatus is carried when in use. The mirror frame, carrying on one side a plane, and on the other a concave reflector, is mounted upon a jointed bar so as to allow of any required adjustment for oblique illumination. A graduated draw-tube, bearing the eye-pieces, slides in the main body of the microscope, for increasing the magnifying power by lengthening the distance between the objective and the eye-piece. The optical portions proper of the instrument consist of three eye- pieces, A, B, and C; an achromatic objective of 1 ½ inch focal length and 22 degrees angle of aperture; one objective 8/10 of an inch focus, 32 degrees angle of aperture, one of 4/10 of an inch focus, 80 degrees angle of aperture, capable of adjustment for varying thicknesses of thin glass cover, and an objective of 1/5 of inch focus, also adjustable for the thin glass cover of the object; the highest power thus attainable being, with the 1/5 objective and deepest eye-piece, without using the draw tube, between 600 and 700 diameters. Of accessory apparatus, this microscope possesses a parabola for dark-field illumination, the rays in the axis of the instrument



Zentmayer's Grand American Microscope.

Continued on page 9

being cut off and the substance examined being viewed as an opaque object; an erector for correcting the inversion of objects produced by the ordinary combination of lenses in microscopes, and chiefly used in making dissections; a polarizing apparatus, with selenite plate, for subjecting objects to the test of polarized light; a condensing lens, on a separate stand, for the direct illumination of opaque objects; a camera lucida, for drawing objects as magnified under the microscope; a stage micrometer, ruled to 1/100 and 1/1000 of an inch; a pair of stage forceps for holding small insects, etc., during examination by low powers; an animalcule cage, a zoophyte trough (a glass vessel with flat sides, for the more convenient examination of microscopic animals in the living state) , and a blue glass cap, which, fitting beneath the stage , renders the light much less trying to the eye of the observer; the whole packed in a neat walnut box, and furnished for $386.00 .

From: **How To See with The Microscope** by J. Edwards Smith, M.D. 1880,
Duncan Brothers, Chicago, Illinois, pages 34-39

ZENTMAYER'S AMERICAN CENTENNIAL STAND

Constructed especially for the Centennial Exhibition. It is mounted on a tripod, with revolving graduated platform; the bar and trunnions are in one piece, and swing between two pillars for inclining the instrument to any angle. The coarse adjustment is accomplished by rack and pinion. Thus far it is similar to the " Grand American Stand " by the same maker.

The swinging sub-stage, which carries the condenser or other illuminating apparatus, including the mirror, swings around a pivot, the axis of which passes through the object observed, so that this object is in every position in the focus of illumination. The stage may be detached with facility, and replaced by one constructed for oblique illumination; the swinging illuminator may then (i.e., with the last-named stage) be used for illumination from above.

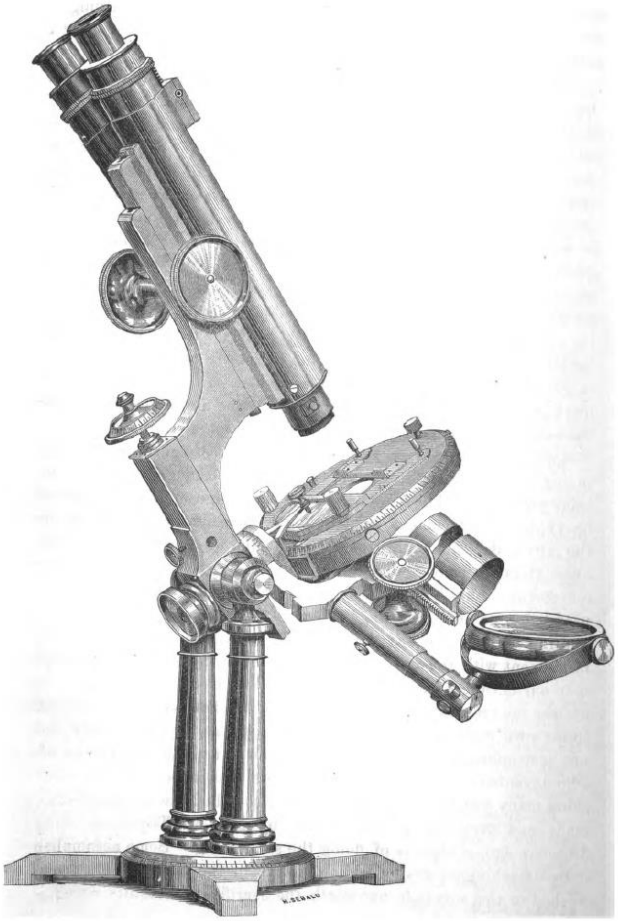
The sub -stage is provided with a graduated circle for indicating the degree of obliquity.

An object placed on the stage being in a plane with the axis of the trunnions, it is obvious that if the instrument is placed in a horizontal position, the object is in the axis of revolution of the graduated platform, and the angular aperture of an objective focused on this object can easily be measured. It is equally obvious that in this position the object is in the centre of all the revolving parts of the instrument, to wit, the revolving stage, swinging sub-stage, and the platform.

The principal stage is similar to the circular one previously used on the " Grand American; " it is provided with adjusting screws for accurate centring, and revolves in a large outside ring, giving facilities for oblique illumination up to 70 degrees from axis (140 degrees aperture), while the graduations serve as a goniometer for the measurement of crystals, etc.

Continued on page 10

The sub-stage is divided into two cylindrical receivers, to facilitate the adaptation of several accessories at one and the same time; the lower cylinder can be moved up and down or entirely removed.



The fine adjustment (in all other instruments of the Jackson model being in front of the body) is removed to the more stable part of the stand. The bar is provided with two slides, one for the rack and pinion movement, and close to it another one of nearly the same length for the fine adjustment, moved by a lever concealed in the bent arm of the bar, and acted on by a micrometer screw. Thus the body is not touched when using the fine adjustment, and the relative distances of objective, binocular prism and eye-piece remain unchanged.

The smaller stage of the American Centennial Stand is also provided with screws for accurate centring ; this stage is three inches in diameter and extremely thin , allowing , in connection with the swinging sub – stage and mirror , not only the greatest obliquity of illumination , but the mirror and achromatic condenser will rise above the stage when required, as in the case of sunlight illumination , that of opaque objects , etc.

The diameter of the sub-stage is the same as that of the " Grand American;" the accessories of that stand are therefore interchangeable.

As to the general character of Mr. Zentmayer's work, the author can affirm with confidence that it is not excelled in any particular. The stand just described is beautiful in design, is nicely proportioned, and in every respect reliable and durable. It will stand all of the tests named in the preceding pages. Those wishing a first- class stand cannot fail to be satisfied with the Centennial.

The swinging sub-stage carrying the mirror, etc., is a most valuable improvement, and one that the observer can hardly afford to be without; the mechanism, too, by which this end is accomplished is of the strongest and most workman-like order.

Continued on page 11

Attention also is invited to the method of attachment of the stage. The latter is solidly held in position, or can in a moment be detached, and another stage substituted.

It has occurred to the writer that the " principal stage " mentioned might very well be dispensed with the smaller stage being quite sufficient. Possibly a large and plain stage might at times be found a convenience, this could easily be substituted for the more expensive one furnished with the instrument.

As to the smaller stage referred to, the author can " Speak by the card." He had used one of Mr. Zentmayer's army hospital stands for years, and the instrument gave him good satisfaction. Two years ago, however, desiring a thinner and a revolving stage, he begged Mr. Zentmayer to devise one and fit the same to his stand. Quite a correspondence ensued, and the army stand was thus equipped, the new stage being practically the same as the small one furnished with the Centennial. It worked nicely, and was, in truth, all that the author desired.

In the change of stages proposed, attention is called to the fact that the smaller stage has not the graduated edge. This to the majority of users would not be a serious objection, while, on the contrary, many would gladly avoid the cost of the graduated circle.

Mr. Zentmayer makes some eight or nine different forms of stands.

Editors Note: There was also some controversy as to who came up with the ideas for the design of this microscope as can be seen in the following article.

WHAT I KNOW ABOUT LATE IMPROVEMENTS OF THE MICROSCOPE

**[A Paper Read by JOSEPH ZENTMAYER
before the Biological and Microscopical Section of the Academy of Natural Sciences, Philadelphia, June 4th, 1877.]**

****[It is proper to note that this discussion was not "provoked " by any mere statements of facts made by Dr. Hunt, but by the unwarranted insinuations contained in his article, which has since been reprinted in the form of a small pamphlet, and distributed quite extensively. -ED. A. J. M.]***

A RECENT paper, by our fellow-member, Dr. J. G. Hunt, entitled: "Post-Centennial Microscopical Notes," read before this section and published in the Cincinnati *Medical News*, has provoked* considerable discussion, especially that part relating to my "American Centennial Microscope. ' As some of these important improvements have been claimed by other makers, I propose to bring the subject before you for investigation, with the endeavor to right the matter satisfactorily to all concerned.

In order to make the investigation a thorough one, it will be necessary for me to call your attention to the so - called Grand American Stand, made for this academy in October, 1859, and which now stands before you. The novel points of this stand, which I claimed at that time, were: 1st. The stage,

Continued on page 12

with graduated revolving plate to serve as goniometer. Although very firm, it is only three - sixteenths of an inch thick, and is, even at the present date, the thinnest mechanical stage made. 2nd. The graduated revolving base for measuring the angular apertures of objectives. 3rd. The hanging of the mirror to a joint as near as possible to the plane of the stage.

Early in 1860, I made three stands (Nos. 13, 14 and 15) precisely like the Grand American, but somewhat lighter to accommodate Dr. Francis W. Lewis, also a member of this section. One for himself, one for Dr. John L. Le Conte, and the third for Mr. S. Weir Roosevelt, a lawyer of New York, since deceased , (which was ordered for him by Dr. Francis W. Lewis.) The latter instrument, as I am informed, is now in possession of his son, James W. Roosevelt, of New York. Mr. Roosevelt was not in favor of mechanical stages, and desired me to design for him a revolving stage, the object to be moved by hand, and it was for him that I constructed the first of my graduated stages, giving a complete revolution in the optical axis , in a large ring, which is adjustable within another by three screws, in order to have the axis of the stage coincident with the optical axis of the instrument, exactly the same as the one before you, which I made for our President , Dr. R. S. Kenderdine, early in 1866.

This stage has been for years extensively copied, in France by MM. Nachet, and in England, among others, by Mr. Crouch, who first (likely in order to make it cheap) left off the centering adjustment, to adapt it a few years later, claiming it as his invention.

The hanging of the mirror by a joint as near as possible to the stage, I adopted long before I made the Grand American Stand. The first large stand I made for Dr. Joseph E. Parker, since deceased, now in possession of Dr. John H. Packard, also a member of this section, has such a swinging mirror.

The microscope, to which I will now call your attention, is one which I made in the fall of 1864 for Mr. E. Furber, 253 Market Street, Philadelphia, who kindly loaned it to me for this evening. The accompanying photograph, which he presented to me about that time, he says was made on Thanksgiving Day, 1864. It is one of my Army Hospital Stands, almost the same as made to-day, except that a sliding sub-stage is attached to the prismatic mirror bar, to receive the accessories . In the photograph you see an achromatic prism for oblique illumination (an apparatus which since then has also been brought out as new). Although handy as a mechanical contrivance, it is not of much importance; the mirror stem is only jointed near the stage , and has not the object under observation as its precise centre. If it had, it would be exactly the same as the swinging sub-stage and mirror of my new " Centennial Stand. " About two years ago, in a conversation with Dr. J. G. Hunt, he pointed out the importance of having an arrangement for illuminating the object by an achromatic condenser in an oblique position . I explained to him how I would make a stand, in which this idea would be carried out in the most complete manner. The design and drawings were made soon after, but the instrument was not brought out, as I intended it for the Centennial Exhibition. Some of you had seen it before, and previous to bringing it to the exhibition, you recollect, it was shown at our meeting here, in April, 1876.

Continued on page 13

The Bausch & Lomb Optical Co., of Rochester, N. Y., exhibited at the Centennial, a microscope stand with glass stage (a modification of mine); the mirror was hung to a swinging arm, and a diaphragm was attached to the mirror stem, quite similar to the instrument and photograph before you, made thirteen years ago. The joint was not in a plane with the object, but below the surface of the stage, and the diaphragm was attached to a lateral slide, in order to make use of it when the mirror was hung obliquely, which is a clear proof that the joint was not in a plane with the object. I admit that in the way they accomplished it, they could have placed the joint higher, as they did in instruments brought into the Centennial Exhibition at a later time, but at a loss of extreme obliquity. To bring their mirror over the stage is utterly impossible. Mr. Gundlach, the designer of this stand, who is in the employment of the Bausch & Lomb Optical Co., since Jan. 1, 1876, might have hung his mirror higher, but he did not" grasp the idea. " Their instrument involved nothing new in relation to the swinging sub-stage, that you do not see in the instrument made for Mr. E. Furber thirteen years ago, which now stands before you.

A few days ago Dr. J. G. Hunt showed to me a letter received from Mr. W. H. Bulloch, of Chicago, accompanied by cut and photographs. Dr. Hunt had the kindness to hand the photographs and cut over to me, and I lay them before you. One photograph shows that Mr. Bulloch has adopted my circular, graduated, adjustable glass stage, claiming this old invention of mine as his own. According to his statement he made it first in July, 1870, just ten years after I introduced it.

The large cut and the other photograph represent his large binocular stand, also with adjusting screws to the adjusting revolving stage. The mirror stem is apparently stationary, and the mirror is attached to it by a double joint, permitting of some oblique illumination . But the most important part of this instrument is an arc below the stage, which is traversed by the sub-stage. The centre of the arc is evidently in the plane with the object, and therefore the sub-stage can be placed radial to the object, provided the somewhat complicated mechanism is made and used with care. The angle of obliquity is, of course, a limited one, and even with a stage as small and thin as my diatom stage, it would not be possible to obtain, either with the mirror or condenser, an angle sufficiently great for the present requirements. As the mirror does not swing with the sub-stage (which, strictly speaking,
cannot be called swinging, except to identify it with mine,) it is difficult to get the mirror centered with the condenser. The photograph is marked September, 1873, making it evident that it is the first attempt to place the achromatic condenser in an oblique position to the optical axis. But comparing this arrangement with mine, as designed and adapted to my stands, the difference in the results, although involving the same principle, will be seen at once. The design of Mr. Bulloch is a heavy, costly attachment limited in its movements, and unhandy, as the mirror does not follow the sub-stage, and when the mirror is used alone it is of no use whatever. In mine the mirror and sub-stage movement is only limited by the body of the microscope, and can be used below or above the stage, always having the object as its centre, and in such a simple way that not a single extra piece is added to an instrument with the ordinary swinging mirror; hence we can adapt it to our cheapest microscopes . Mr. Bulloch claims to be the first to use the mirror above the stage instead of the bulls - eye, according to his own statement, in 1870. I can only say, if Mr. Bulloch did not accomplish it before that time, that he is the last one I know of, who invented it. Spencer,

Continued on page 14

Tolles, others and myself did the same thing many years before; and the little so-called candlestick stand, made and presented to our section by Mr. Ed. Tilghman, about eighteen years ago, is capable of doing the same thing. Some accomplish it by detaching, others by adding, joints to the mirror. If accomplished in this way it is not worth the sacrifice of stability which is incurred.

But with my swinging arrangement, unobstructed by any part of the microscope but the body, it is an unsought, natural result of the thoroughness and simplicity of the mechanical contrivance, which constitutes the value of my patent.

Gundlach's Stands

The following letter, published in the Cincinnati *Medical News*, explains itself:
To the Bausch & Lomb Optical Company:
GENTLEMEN- I think I owe it to myself, as well as to you, not to permit the remarks contained in a foot note to Dr. Hunt's article on Microscopes at the Centennial Exhibition in Philadelphia, which appeared in the Cincinnati *Medical News*, of March, to pass without a few remarks on my part. The note in question is as follows:

"It is stated in the *Naturalist* for December, that a firm from Rochester, New York 'hinged the sub -stage bar at the level of the object,' but the small stands exhibited by said firm at the opening of the exhibition were not so made, nor had they any facility for registering obliquity. The firm in question did not grasp Zentmayer's idea at all, and hence can justly claim no priority of invention."

For obvious reasons, the " firm from Rochester, N. Y., " mentioned in the above note, can be no other than the Bausch & Lomb Optical Co., of this city, and as the microscope department of your company has been under my sole superintendence since you began making these instruments, it must be myself individually who , in the opinion of the writer of said note, failed to " grasp Zentmayer's idea. " Feeling thus my integrity called in question, I beg leave to submit to you, and to the public generally, the following statement:

As early as towards the close of the year 1875, and before I had the pleasure of forming your more intimate acquaintance, I had already communicated to Prof. Phin my intention to add the construction of improved stands for microscopes to the business I had till then exclusively followed since my arrival in this country, viz., the construction of objectives.

The projected improvements embraced, among others, my now well known fine adjustment, a modification of the glass stages used by many opticians; and finally, the hanging of a swinging bar, carrying the mirror and other illuminating apparatus, in the plane of the object.

The construction of a stand with all the aboved named improvements was begun about the end of January, 1876, in the factory of the Bausch & Lomb Optical Co., after my arrangement with your company had been effected . In the construction of that stand I had in view the employment of a

Continued on page 15

solid glass stage (not open in the centre) expecting to gain thereby the advantage of very oblique illumination in consequence of the refraction at the surfaces.

In order to obtain practically the optical object I had in view in placing the centre of rotation of the illuminating apparatus in the plane of the object, I had to take this refracting power of the solid glass stage into consideration , and consequently had to place the central point of rotation as much under the actual (mathematical) plane of the object as the glass stratum of the stage would have lifted the ray.

Convinced, however, by the criticism of competent judges, and by my own observations , that the solid glass stage (without central opening) offered optical disadvantages which neutralized to a great extent the benefits which could be derived from it, I subsequently abandoned glass stages of that construction, not, however, before a number of stands had been either constructed , or were in the course of construction , arranged in regard to the hinging point of the illuminating apparatus, in such a manner as to suit a solid glass stage. The point selected by me for the centre of rotation of the illuminating apparatus in these stands would have been optically the correct one, if a solid glass stage of my construction had been employed.

The stands whose construction was complete at the time, and those then in process of construction, were not altered , firstly, because it would have involved considerable expense to do so ; secondly, because I deemed the deviation from the actual plane of the object so slight as to be of very little consequence, especially as the actual and mathematically correct plane of the object is variable, owing to variations in thickness of the glass slides , and therefore practically unattainable for the centre of rotation , unless said centre can be made adjustable to it.

Of these stands, so made and left unaltered, one was sent, with other microscope stands of our make, to the Philadelphia Exhibition , and was there at the opening of the same, and the examination of this stand may have given rise to the impression that I intended to place the centre of rotation of the illuminating apparatus lower than the plane of the object. The other stands, constructed with a view to using the glass stage, with central opening, and having the swinging mirror bar hinged slightly above the upper surface of the glass stage, were unfortunately not quite finished at the time the Exhibition opened.

What I contend for, and stand ready to prove is , that stands of my construction , exhibited at the opening of the Philadelphia Exposition, had the arrangement of the swinging mirror bar (with diaphragm attached) hinged in the (as near as attainable) optically correct plane of the object, with a view to the use of a solid glass stage without central opening, and the change necessary to fit the same for the use of stages of different descriptions was simply not then effected for want of time.

Other stands were then in process of construction, arranged to meet the altered circumstances, and were afterwards exhibited at the Centennial Exhibition in Philadelphia, all of them conceived by me, and executed under my superintendence, before I had seen or heard of Mr. Zentmayer's efforts in the same direction.

Continued on page 16

I may not be the only, nor the first, inventor of this arrangement, and the very moderate amount of inventive faculty involved therein makes it easy to believe that others have conceived the same idea at the same time, or even before me. It is far from me to disparage the honest efforts of others, and to charge plagiarism on any one; but I believe I am pardonably sensitive when such a charge as is contained in the foot note to Dr. Hunt's article , is brought against me, a charge which, as you your-selves well know, is utterly groundless , and entirely inconsistent with the facts in the case. I remain, gentleman,
Very respectfully yours,

E. GUNDLACH.
Rochester, N. Y., May 17th, 1877.

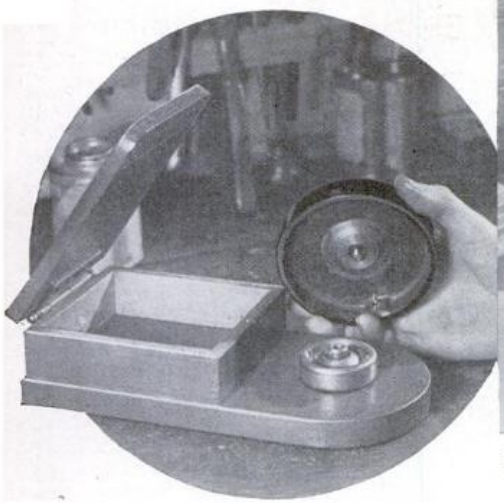
Above Left: From: The American Microscopical Journal, Vol. VII.-No. 1, January 1886, No. 73, Washington, DC Page ii

Above Right: From: The American Microscopical Journal, Vol. VII.-No. 2, February 1886, No. 73, Washington, DC Page iv

No great advance has ever been made in science, politics, or religion, without controversy.
~ Lyman Beecher,
(October 12, 1775 – January 10, 1863)
Presbyterian minister

The following article is courtesy of Popular Science Magazine, February 1937, page 67

The turntable disk rests on a roller-skate wheel, as shown below. The arm rest covers a storage space



A ring of shellac being built up on a microscope slide with the aid of the turntable. The disk is spun by hand, and shellac is applied with a small, artist's painting brush

Microscope Turntable

FOR MAKING SPECIMEN SLIDES

By Morton C. Walling

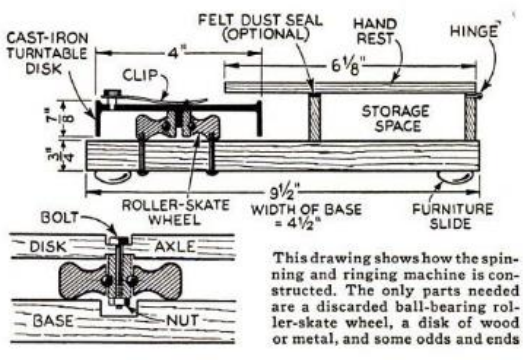
FEW pieces of auxiliary equipment will prove more valuable to you in your work with a microscope than a well-made turntable or "spinning wheel." With it you can quickly build up rings of shellac on microscope slides to provide cells for large specimens, or apply the circular seal of cement to hold a cover glass in place.

The usual type of spinning machine consists simply of a base on which is mounted a rotable circular disk, or wheel, and a convenient hand rest. The top of the disk is provided with spring clips for holding a specimen slide. To make a cell, the operator clips a slide to the turntable, centering it accurately; dips a small, round, artist's brush in fairly thick shellac, gives the table a spin, and holds the brush tip so that it traces a ring on the rotating slide. Successive applications of shellac build the ring to any desired height. In a similar way, the turntable is used to produce neat rings around the edges of circular cover glasses, with asphalt varnish, shellac, or other sealing material.

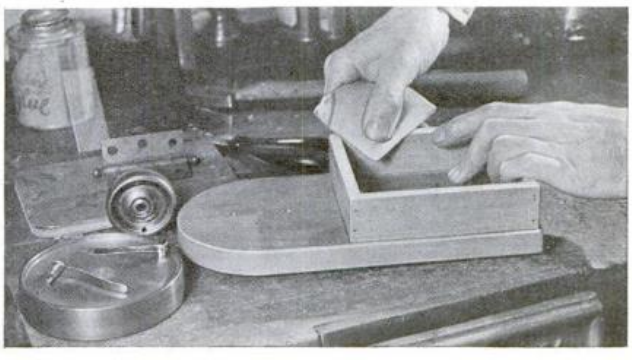
Although a variety of commercial turntables are available, the amateur microscopist can provide his home laboratory with a really professional model from a few odds and ends of wood and an ordinary ball-bearing, roller-skate wheel. First cut a base piece to the dimensions indicated in the drawings (a size to take a four-inch disk), and mount the skate wheel as shown. There are several ways of doing this. In the model illustrated, the wheel was drilled and tapped to receive two 6-32 machine screws that pass through the base piece. If the wheel axle does not clear the base piece when the wheel is resting on its side, a depression should be cut beneath it. The axle must rotate freely.

The turntable disk shown is made of cast iron, with a brass center pin that enters the quarter-inch hole in the skate-wheel axle. However, the disk can be made equally well of wood or plywood one-half to three-quarters of an inch thick. The disk should run as true as it is possible to make it. If feasible, a lathe should be used in shaping it. On the top surface of the disk, mark the exact center, and several concentric rings about one-eighth of an inch apart, so that the slide can be centered easily. You can do this after the disk is in place. The clips used to hold the slide in place on the disk are similar to those used on microscope stages. They can be simple strips of springy metal or, as shown in the photograph, a pair of clips from the stage of a professional-type microscope.

The hand rest is a piece of plywood one quarter or three eighths of an inch thick, extending about halfway to the center of the disk. It must be supported high enough above the base piece to clear the clips. In the model shown, this support consists of a boxlike frame, made of ¼ by 1¼-inch wood strips. The hand rest is hinged to the edge of the frame opposite the disk, thus forming a lid for a compartment in which spare slides, containers of shellac, and other supplies can be kept.



This drawing shows how the spinning and ringing machine is constructed. The only parts needed are a discarded ball-bearing roller-skate wheel, a disk of wood or metal, and some odds and ends



Calendar of Events

March 7-9, 2025 - Middleburg Heights, OH – Gem Street USA. Cuyahoga County Fairgrounds, 19201 East Bagley Road, Middleburg Heights, OH 44130. For additional information visit: http://www.gemstreetusa.com/

March 7-8, 2025 – Richboro, PA – 49th Annual Leidy Microscopical Society Micromount Symposium. Celebrating 100 years of Microscopical Magnificence. Advent Lutheran Church, 45 Worthington Mill Rd, Richboro, Pa. 18954. Friday 12:00 Noon to 6:00 PM, Saturday 9:00 AM to 6:00 PM**. Two great speakers – 'Diving into Olivine' by Geologist Chris Duerr and 'The Fascinating World of Diatoms' by Bill Dailey.** Table Space (for two days): $25.00 for half of a 6-foot table, $40.00 for a full 6-foot table. Visitor's fee $5.00 for Friday, $10.00 for Saturday (Includes Lunch). Reservations/ Admission: Make checks payable to; Don McAlarnen, 916 Senator Rd, East Norriton, PA 19403 Phone: (610) 584-1364 Questions: Email: donmcalarnen@outlook.com

March 8, 2025 - Linglestown, PA - Rocks4Kids Jr Education Day! Linglestown Life United Methodist Church, 1430 North Mountain Road, Linglestown, PA 17112. Saturday from 10:00 AM to 3:00 PM. For more information visit: http://www.rocks4kids.org/

March 8-9, 2025 - Meriden, CT - Annual Mineral & Gem Show. Maloney High School, 121 Gravel Street, Meriden, CT 06450. Saturday 9:30 AM to 5:00 PM, Sunday 10:00 AM to 4:00 PM. For additional information visit: http://www.lmscc.org/

March 8-9, 2025 - New York, NY - New York Gems Jewelry & Mineral Show. The School of Fashion Industries (Gym 3rd Floor), 225 West 24th Street, New York, NY 10001. Saturday 10:00 AM to 6:00 PM, Sunday 11:00 AM to 5:00 PM. For additional information visit: http://www.barygems.com/

March 15-16, 2025 - Gaithersburg, MD - Gem, Mineral & Fossil Show. Montgomery County Fairgrounds, 16 Chestnut Street, Gaithersburg, MD 20877. For additional information visit: http://www.glmsmc.com/

March 19, 2025 – Willow Grove, PA – Leidy Microscopical Society Regular Meeting 6:30 PM to 8:00 PM, Giant Community Center, 315 York Road, Willow Grove, PA, the subject of the meeting will be "A Treasure Obtained at the 49th Annual Leidy Microscopical Society Micromount Symposium". Additionally, those who are present will critique the symposium on how to make improvements." Members and guests are requested to share their treasure for discussion and viewing. Everyone is invited even if you do not have a microscope.

March 22-23, 2025 - Chicopee, MA - Connecticut Valley Mineral Club Show. Castle of Knights, 1599 Memorial Drive, Chicopee, MA. Saturday 9:30 AM to 5:00 PM, Sunday 9:30 AM to 3:30 PM. For additional information visit: http://www.cvmineralclub.org/

Continued on page 19

March 29-30, 2025 – Plymouth Meeting, PA - 2024 Mineral Treasures and Fossil Fair sponsored by the Philadelphia Mineralogical Society and Delaware Valley Paleontological Society. Lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA., (PA Turnpike, exit 333; or I-476, exit 20) Free Parking. Saturday 10:00 AM to 5:00 PM, Sunday 10:00 AM to 4:00 PM. Adults: $7.00. Kids 12 and under: $2.00; Uniformed scouts and troop leaders free. Special Features: On both days a line-up of distinguished professional speakers will be presented. In addition, there will be fossil and mineral displays, educational materials, door prizes and a food concession. For additional information visit: www.phillyrocks.org

March 29-30, 2025 - Canton, OH - Stark County Gem & Mineral Show. Stark County Fairgrounds, 305 Wertz Avenue NW, Canton, OH 44708. Saturday 9:00 AM to 5:00 PM, Sunday 10:00 AM to 5:00 PM. For additional information visit: http://www.facebook.com/StarkCountyOhioGemandMineralClub/

April 5-6, 2025 - Midland Park, NJ - 35TH ANNUAL NORTH JERSEY GEM, MINERAL & FOSSIL SHOW. Midland Park High School, 250 Prospect Street, Midland Park, NJ 07432. Saturday 10:00 AM to 5:00 PM, Sunday 10:00 AM to 4:00 PM. For more information visit: http://www.nojms.com/

May 2-4, 2025 - St. Catharines, Ontario, Canada - 61st Micromount Symposium of the Canadian Micro Mineral Association. Brock University, 1812 Sir Isaac Brock Way, St. Catharines, ON L2S 3A1, Canada. Registration forms and information are available online. For additional information visit: https://canadianmicromineralassociation.com/

May 16-18, 2025 – Newry, ME - New England Mineral Association Conference. Grand Summit Resort Hotel at the Sunday River Resort, 15 South Ridge Road, Newry, ME 04261. For additional information visit: http://www.nemineral.org/annual_conference/

May 17-18, 2025 - Bennington, VT - Southern Vermont Mineral & Gem Show. Grace Christian School, 104 Kocher Drive, Bennington, VT 05201. Saturday 10:00 AM to 5:00 PM, Sunday 10:00 AM to 3:00 PM. For more information visit: https://www.manchestervermont.com/

May 25-27, 2025 – Aurora, NC - North Carolina Fossil Festival. Aurora Fossil Museum, 400 Main Street, Aurora, NC 27806. For additional information visit: http://www.aurorafossilmuseum.org/

June 14-15, 2025 - Cherry Hill, NJ - South Jersey Gem, Jewelry, Mineral, & Fossil Show **NEW LOCATION**. Trinity Presbyterian Church, 499 Route 70 East, Cherry Hill, NJ 08034. Saturday 10:00 AM to 5:00 PM, Sunday 10:00 AM to 5:00 PM. For more information visit: http://sjmineralshow.com/