



Newsletter of the

New York Microscopical Society

1 Prospect Village Plaza
(66F Mt. Prospect Avenue)

Clifton, New Jersey 07013-1918

GPS: Latitude 40.8648N, Longitude 74.1540W

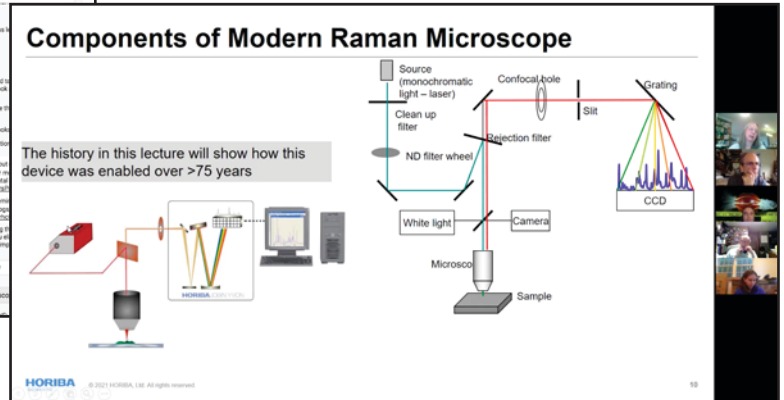
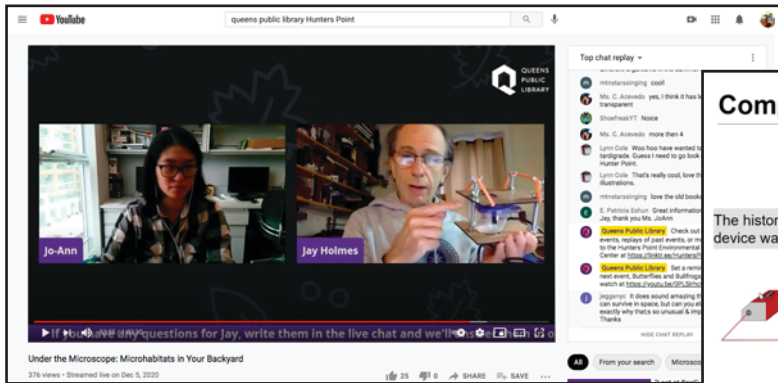


June 2021

Editor (646) 334-0344

Volume 35 Number 1

Pivoting Programing Recap



It has been one crazy year. I hope that you are well and to those who suffered loss this year, my deep condolences and wishes that fond memories will linger and comfort. For those who have struggled with isolation and the challenges of being far from those we care about, I hope you are soon able to share precious time together and savor those moments in a way that maybe before the pandemic we lost track of in the hustle and bustle of daily life.

At NYMS we have tried a few new things to maintain the connections and reach out in new ways to encourage learning and exploration of the microscopical world. Way back a year ago we Initiated our venture into the remote world with "Open Mic Night" with members chatting and sharing informally. We followed that up with two "deep tech" lectures in the summer and fall. Then in 2021 we kicked things off with about 100 participants in our first collaborative session with the Quekett Microscopical Club in England, where our friend Dr. Randy Miller gave a program on tardigrades that went on with an hour of Q&A post lecture! It was wonderful to connect with like minded microscopists from across the US and the pond! This lecture connects with our Waterbear Survey of the Northeastern United States, which is making progress and the first

publication of findings will be released soon. If you would like to join that project please e-mail me at jholfmes@igc.org and I will send you the protocol and sample submission guidelines which appeared in NYMS newsletters of last year. Dr. Miller and Mike Shaw have contributed additional tardigrade articles to this issue, so I hope you enjoy those pieces.

In outreach this year we partnered with teh Queens Public Library with three live streamed microscopy in our back yard sessions, 2 of which are now available on YouTube.

Our most recent event, our May lecture by NYMS Board member Dr. Fran Adar of the history of Raman Microscope brought us back to our deep tech learning around the tools of microscopy.

We hope to continue these "remote" connections and collaborations which help broaden our community, and soon we will be able to gather again in person. We have our rescheduled Central Park NYMS picnic coming up on Sunday, July 25, 2021. See the attached flier and mark you calendars.

Be well, and I hope to see you soon, Jay Holmes.

The Mission of the New York Microscopical Society

is the promotion of theoretical and applied microscopy and the promotion of education and interest in all phases of microscopy.

A not-for-profit Educational Organization, (nyms.org)

New York Microscopical Society Officers and Committee Chairs

President & Editor 2020-21, Jay Holmes, Outreach Program Chair, Membership/Social Media Chair, Manager 2018-21

Vice President & Assistant Treasurer 2020-21, John Scott, Curator/Archivist, Facilities Co-Chair, Website Co-Chair, Program Chair, Past President, Manager 2018-21

Secretary 2020-2021, Brooke Kammrath PhD, Awards Co-Chair, Past President, Manager 2019-22

Treasurer 2020-2021, Mel Pollinger, Facilities Co-Chair, Manager 2020-23.

Board of Managers:

Manager 2018-2021, Jay Holmes

Manager 2018-2021, Deb Kapell, Assistant Chair of Outreach

Manager 2018-2021, John Scott, MA, MBA, MA-CAS, Past President

Manager 2018-2021, Lou Sorkin, BCE

Manager 2019-2022, Peter Diaczuk, PhD, Education Chair, Past President

Manager 2019-2022, Brooke Kammrath PhD, Past President

Manager 2019-2022, Seymour Perlwitz

Manager 2019-2022, Roland Scal, PhD

Manager 2020-2023, Fran Adar, PhD

Manager 2020-2023, Julie Cohen, Website Co-Chair

Manager 2020-2023, Mel Pollinger

Manager 2020-2023, John Reffner, PhD, Awards Co-Chair, Past President

Dues and Addresses

Please remember to mail in your Dues to:

John Scott, Treasurer
New York Microscopical Society
PO Box 20098LT
New York, NY

Annual:

- Junior (under age 18)\$10
- Regular\$30
- Student (age 18 or above) ..\$20
- Supporting\$60
- Corporate (includes one advertisement in NYMS News)\$175
- Life\$500 (payable within the year)

To avoid missing notices: Notify John Scott if you have changed your address, phone or email.

Awards Given by the New York Microscopical Society

The New York Microscopical Society takes great pleasure in recognizing and rewarding individuals who have contributed to either the activities of the society or to furthering microscopy.

These awards are described in our website and in a pdf file for our email newsletter recipients. All members are eligible to nominate individuals for these various awards, and are encouraged to do so.

John A. Reffner, Awards Committee Chairperson

Committee Members:
Jan Hinsch
Peter Diaczuk
John R. Reffner



To Order Your NYMS Lapel Pins

Send a check in the amount of \$12.00 per pin to:

New York Microscopical Society

John Scott, Treasurer
PO Box 20098LT
New York, NY

To avoid shipping & handling charges, pins may be purchased directly at any NYMS meeting for \$10.00.

Jay Holmes, Newsletter Editor
3657 Broadway, Apt 2C
New York, NY 10031

What is a group of Tardigrades called?

William R. Miller¹ and Emma Perry²

A few summers ago, a student asked, “What is a group of Tardigrades called?” I could not answer, I was stumped, flummoxed and embarrassed. I stammered and finally said I did not know but would look it up. I searched the literature and have not been able to find an answer.

A group of tardigrades are referred as a population, a collection or simply in the plural. A group is often implied as a member of a species or a genus. They are written about by their collective higher classifications of class, order or family. The Heterotardigrada are often contrasted with the Eutardigrada or the Hypsiibidae vs the Macrobiotidae. But, we could not find unique or common names for specific or general assemblages of tardigrades.

We all know about a flock of birds, a murder of crows, a stand of flamingos and a gaggle of geese. You have heard of a school of fish, or a swarm of bees, a pack of wolves, a herd of deer, or a pod of whales. Everyone recognizes a colony of Penguins, a covey of quail, a rookery of herons, a gang of turkeys, a band of gorillas, and a troop of baboons. We have been exposed to a colony of bats, a mob of kangaroos, a pride of lions, a nest of snakes, and a stink of skunks. And there are many more unique, amusing, and entertaining names for groups of animals. But what is a group of Tardigrades be called?

We feel compelled to try to fill the gap and advance a suggestion to name a group of tardigrades. Students suggested a “Ladder of tardigrades” because they climb, a “Sloth of tardigrades” because they are slow, a “Crypto of tardigrades” because they desiccate, an “Octagon” because they have 8 legs, a “Tun-al of tardigrades” because the tun is how they survive, a “Super” of tardigrades because they are extraordinary, a “Mystery” of tardigrades because we know so little about them, a “Plethera” of tardigrades because there are so many, a “Google” of tardigrades because they are everywhere, a “Buccal” of tardigrades because they all have buccal tubes, a “Vepo” of tardigrades from the Greek for water, an “Acqua” of tardigrades from the Italian for water, or a “Spalli” of tardigrades for Spallanzani who first called them water bears, and the list goes on.

We like “spalli” as the universal common name for a group of tardigrades. We would be able to say, “we found a mixed spalli of tardigrades at site....”, or “within that moss sample the spalli of tardigrades was all the same species”. Have a better idea?

¹ Baker University, Baldwin City, KS 66006 William.Miller@BakerU.edu

² University of Maine, Orono, ME. 04469 Emma.Perry@UMaine.edu

Basics of Tardigrade Identification

1.0.0.0

By Michael Shaw and William Miller

Is this a Tardigrade?

If you soak lichen shavings or a pinch of moss in a small bowl overnight and look at the debris on the bottom of the dish through a dissecting microscope at only 20-30X, you will encounter a whole world of neat and different animals. In fact, this is one of the few places where you are likely to see five to six phyla in the same sample.

First is the phylum **Rotifera**: These guys may look like an inch worm scooting along or a small windmill with its wheel organs rotating on its head. It may be telescoping as it bends and moves. When desiccated it looks like a barrel. They are generally transparent but may have orange spots (Fig 1).

Next is the phylum **Nematoda**: it looks like a stiff worm that may be flailing about or curled up in a coil in a corner or stretched out at an arch. It may be from half a millimeter to several millimeters long. They are generally transparent and colorless (Fig 2).

You may see a **mite**, phylum **Artropoda**, class Arachnida, marching through the debris, or just thrashing its legs about. The eight legs emerge from just behind the head and before the enlarged abdomen (Fig 3).

You may notice protozoans: The *Actinosphaerium* is a protozoan and belongs to the Phylum **Sarcodina**. It looks like a sea urchin and is from 200-1000 micrometers wide, very large for a proazoan. Other protists in the phylum **Protozoa** you might see will be small single cell specs and blobs that flit about the dish. They generally are so small and erratic that you can't focus, some seem to flow over the bottom and around objects, others move rapidly. Some may have spots, others are plain (Fig 4).

You may see a collembola, phylum **Artropoda**, class Entognatha, jump across you field of view. A bigger animal (1-3mm) with a lever under its body that can "jump" where it wants to go. A primitive insect with 3 body parts and the legs attached to the mid-section (thorax) (Fig 5.)

Finally – you might see a TARDIGRADE!

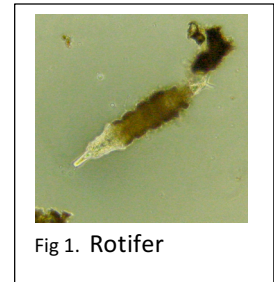
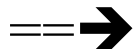


Fig 1. Rotifer

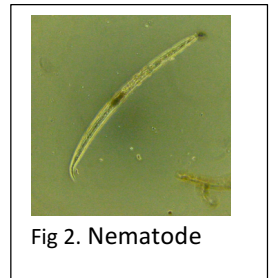


Fig 2. Nematode

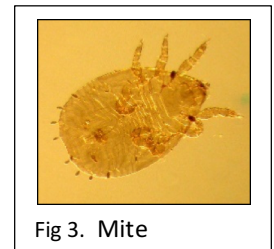


Fig 3. Mite

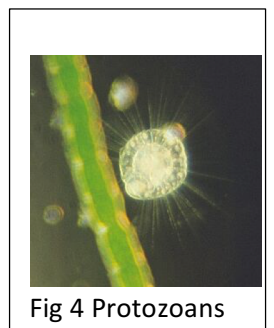


Fig 4 Protozoans

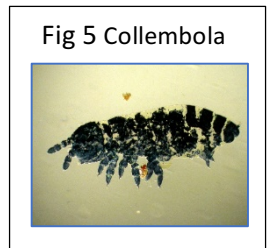


Fig 5 Collembola

A Tardigrade, phylum **Tardigrada**, is small, about ½ mm, like a miniature caterpillar, like an animal that may be walking about, floating on the bottom of the dish or climbing on the debris. It may be transparent, white, brown, yellow, pink, red, or green. It might be active or stretched out and lethargic. A tardigrade has 8 legs arising along its body, with two legs trailing from last segment. Claws are on the ends of each leg.

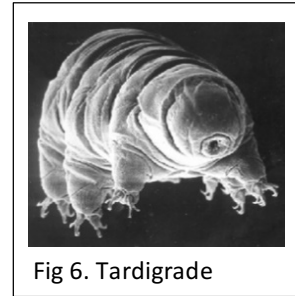


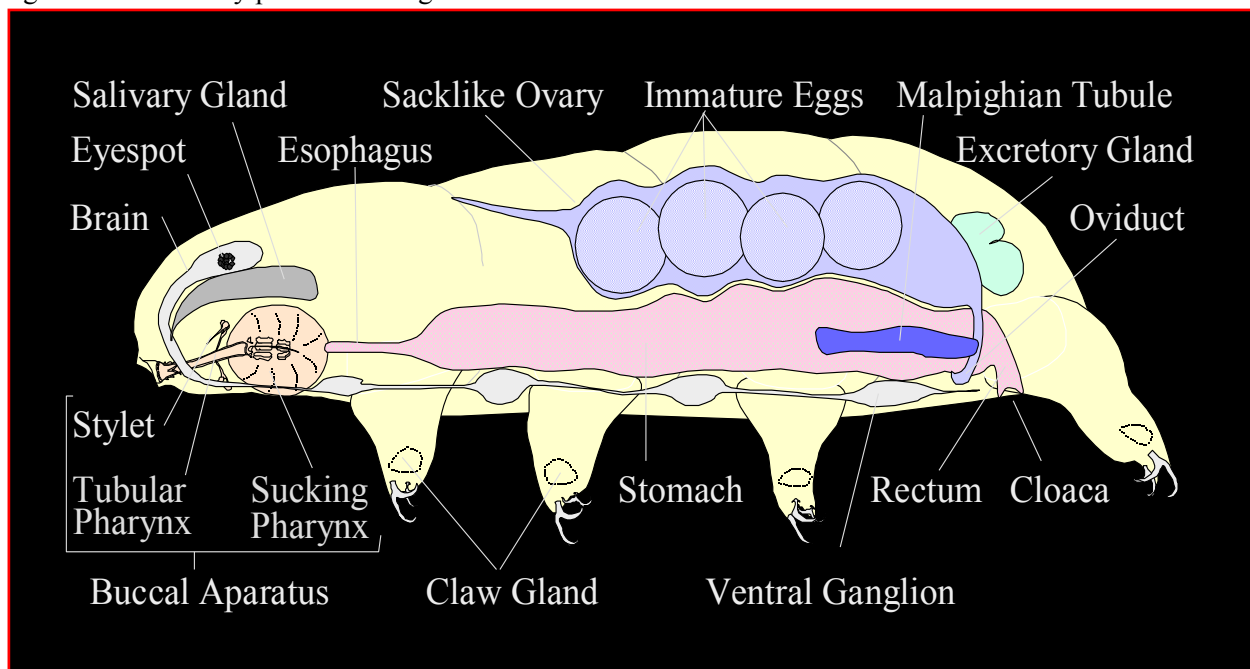
Fig 6. Tardigrade

Phylum Tardigrada has a unique combination of body parts and organ systems that are a different combination from any other organism on earth.

So, what makes a tardigrade different? Some characters you can see, but others you cannot.

1. Elongated body with 5 segments
2. Eight legs ending in claws
3. Complex mouth parts with stylets and pharynx
4. Full alimentary and excretory systems
5. Separate sexes, single gonad and lays eggs
6. Dorsal brain with a ventral double ladder nervous system
7. Many have eyes
8. Cross body musculature
9. Sheds its cuticle to grow
10. But oddly, No Circulatory, Respiratory, or Skeletal Systems

Figure 7. Basic Body plan for Tardigrade



Send questions to William.Miller@BakerU.edu.

In the next Issue we will look at the differences among the three classes of water bears.

Book Review:

Antarctic Days by James Murray and George Marston

By Michael Shaw

I've just finished reading a book by James Murray called *Antarctic Days*, and I'm quite impressed. In case you've not heard of James Murray, he's a biologist and one of the early tardigradologists, especially known for his excellent drawings.

His book, co-written with George Marston, an illustrator, is an account of the British Antarctic Expedition via sailing ship from Europe to Antarctica. The voyage takes place over a period of two years (1907-1909) around the Cape of Good Hope, Africa, across the Indian Ocean, and to Antarctica via New Zealand.

About James Murray—he was born in Glasgow in 1865 and he studied Zoology at Glasgow University. Murray also took art classes at Glasgow School of Art. This explains the high quality of his drawings of tardigrades. Long before there were microscope cameras or microscope apps for smartphones, one had to make drawings of micro-organisms like bacteria or parts of the tardigrade. Murray was very careful about noting the sizes of tardigrades as well, which you can see in his drawings.



In 1902, he participated in a biological survey of Scottish freshwater lochs and continued to do research until 1913, having written over 20 papers. (See a list of his papers as an addendum here.) He contributed to tardigrade science by describing 66 species of tardigrade and was elected a Fellow of the Royal Society of Edinburgh (FRSE), awarded the Society's Neil Prize for the period 1909-11.

This brings us to Murray at the age of 41 when he served on the British Antarctic Expedition under Ernest Shackleton on the vessel "Nimrod." Murray's book, *Antarctic Days* tells the story from a biologist's point of view. One truly gets the sense of what sea travel on a sailing ship was like in the early 1900s. Imagine trying to use a microscope on board a rolling ship in turbulent weather! Murray describes in detail the challenges of collecting specimens at sea, the near impossibility of making drawings of them in a tiny dark cabin, and the constant battle with the crew for scientific working space.

What I found most striking were Murray's philosophical, moral, and ethical observations. He was emotionally torn between his respect for all life and the necessity of scientists to take a life in order to study it. He often expresses regrets at the trusting innocence of penguins, especially their lack of fear, met with gleeful and brutal treatment by man, slaughtering them for food.

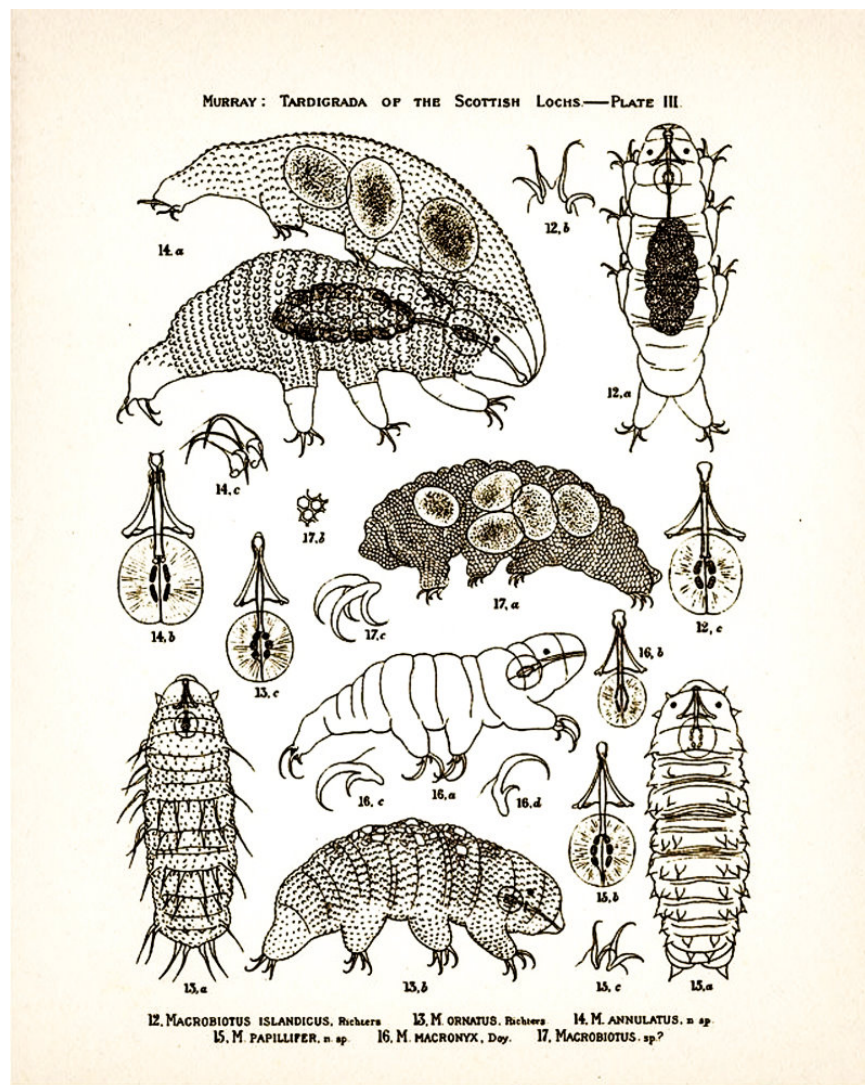
On the bright side, Murray's colorful narrative is mostly upbeat and humorous, peppered with jokes, poetry, traditional stories, and anecdotes of pranks and camaraderie with scientific colleagues and crew.

Of additional historical value is the contribution by Marson on the topic of sea chanties. These are the traditional work songs of sailors, many of which are lost to forgotten oral tradition. Fortunately, Antarctic Days includes numerous references to these songs of work and play, and Marston devotes a whole chapter to music and lyrics of some more well know chanties. You may be familiar with chanty, “Blow the Man Down” from the old Popeye cartoons, but did you know that the song, “Shenandoah,” made popular by Glen Campbell was also a chanty? The original music and lyrics can be found in Antarctic Days.

First editions are highly collectable, but a hardcover edition is available on Amazon as a reprint. My copy is 200 pages, and besides the narrative, it is loaded with excellent photos and illustrations as well. For scientists and armchair explorers, I give this book a thumbs up rating of “highly recommended.”

How did I discover James Murray and this book? I became a James Murray fan upon seeing his Plate III from *Tardigrada of the Scottish Lochs*. Grab your free copy of this restored print at the link below. You will also learn where to get a free copy of the book, and more about the adventures of James Murray, as well as about his strange disappearances. [James Murray Poster and Bio](https://www.tardigrade.us/free-book-poster-and-more/)

<https://www.tardigrade.us/free-book-poster-and-more/>



MEMORIES OF ANTARCTIC DAYS

BLOW THE MAN DOWN

As I was a - roll - ing down Par - a - dise Street To me Weigh -
 aye, blow the man down. A pret - ty young mal - den I
 chanced for to meet. Give us some time and we'll blow the man down.

She was round in the counter and bluff in the bows.
 Chorus. To me, Weigh-aye, blow the man down.
 She was round in the counter and bluff in the bows.
 Chorus. Give us some time and we'll blow the man down.

Oh, where are you going to, my pretty maid ?
 Chorus. To me, Weigh-aye, blow the man down.
 Oh, where are you going to, my pretty maid ?
 Chorus. Give us some time and we'll blow the man down.

I'm going a-milking, kind sir, she said.
 Chorus. To me, Weigh-aye, blow the man down.
 I'm going a-milking, kind sir, she said.
 Chorus. Give us some time and we'll blow the man down.

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CHANTIES

SHENANDOAH

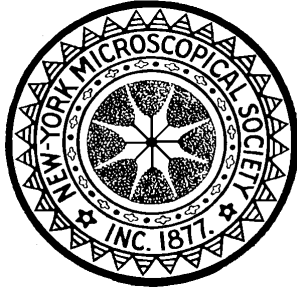
Oh, Shenandoah, I love your daughter.
 Away, my rolling river.
 Shenandoah, I love your daughter,
 Away, we're bound away across the wide Missouri.
 Polly's girl just took my fancy.
 Away, my rolling river.
 She's clipper built, her name is Nancy.
 Away, we're bound away across the wide Missouri.

I take her coral beads and laces.
 Away, my rolling river.
 I love to call her queen of faces,
 Away, we're bound away across the wide Missouri.

She lives alone in London City.
 Away, my rolling river.
 Perhaps you'll think it's more the pity.
 Away, we're bound away across the wide Missouri.

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New York Microscopical Society

One Prospect Village Plaza

(66 Mount Prospect Avenue)

Minutes, NYMS Managing Board meeting, June 3, 2021, via Zoom, at 7:00pm EST

1. **Call to order at 7:02pm EST:** President, Jay Holmes
2. Secretary for the meeting: Brooke W. Kammrath
3. **Quorum count** (we need six Managers participating): Jay Holmes (President), John Scott (Vice President, Treasurer), Brooke Kammrath (Secretary), John Reffner, Fran Adar, Seymour Perlowitz, Roland Scal, Julie Cohen, Peter Diaczuk, Louis Sorkin, Deb Kapell
4.
 - A. Designation of 2 individuals for the 3-member NYMS Finance Committee (to assist our Treasurer, John Scott), who will serve as responsible persons for NYMS assets. Treasurer John Scott, appoints the following 2 people to the finance committee: Peter Diaczuk & Louis Sorkin. Both accept their nomination. The Board unanimously agrees with the nominations.
 - B. Review proposed items described below and to be voted upon at this meeting by the Board of Managers:

Current NYMS Treasurer, John Scott, posed the following question to F Grayeski (NYMS CPA): Do you have any general or specific advice, or links to information, about regaining banking accesses when previously responsible persons are not available to facilitate?

F Grayeski response:

Each bank has different rules and requirements for transitions. Usually, if you provide them an official Board Resolution signed by the Secretary and Treasurer stating that there has been a transition of Treasurers, the Bank will then allow a change of Signatories, and request new Signatory Cards. I suggest having at least 2 Signatories to facilitate any future transitions and avoid disruptions in the future. I suggest contacting the various banks regarding their specific requirements for transition. I can help you work on whatever documentation they require).

Current NYMS Treasurer, John Scott, proposes a number of Board of Managers resolutions to address various aspects of confirming NYMS' control of NYMS' assets in three separate banks. One of NYMS' banks is **Columbia Bank in Fair Lawn, New Jersey**, where NYMS' funds may currently be deposited in a savings account and or a checking account and in certificates of deposit. Another of NYMS' banks is **Teachers Federal Credit Union in Manhattan, New York**, where NYMS has recently opened accounts for saving and checking. A third NYMS bank is investment bank **Merrill Lynch**, currently one of its New Jersey offices, where it seems NYMS' funds are presently deposited in a money market fund.

I [John Scott, current NYMS Treasurer] recommend that we resolve as follows, or close versions of each:

1. Resolved on June 3, 2021 by the Board of Managers of the New York Microscopical Society (NYMS): Whereas former NYMS Treasurer Melvin Pollinger is apparently the only local signatory to NYMS' checking and/or savings accounts with Columbia Bank (CB) NNN branch, we direct that by or before Friday June 11, 2021, Melvin Pollinger will transfer the total of all NYMS funds on saving or checking deposit with CB as of June 3, 2021, all NYMS' funds deposited with CB other than in certificates of deposit, to NYMS' checking account number 6008244707 at Teachers Federal Credit Union (TFCU) routing number 221475786.

2. Resolved on June 3, 2021 by the Board of Managers of the New York Microscopical Society (NYMS): Whereas former NYMS Treasurer Melvin Pollinger has been directed to effect transfer no later than June 11, 2021 all NYMS funds on saving or checking deposit with Columbia Bank (CB) NNN branch as of June 3, 2021, to NYMS' checking account number at Teachers Federal Credit Union (TFCU), we further and additionally direct that if said transfer has not been affected by June 11, 2021, then by or before Friday, June 18, 2021, or as soon thereafter as normal CB procedures permit, CB must effect transfer of the total of all NYMS funds on saving or checking deposit with CB as of June 3, 2021, all NYMS' funds deposited with CB other than in certificates of deposit, to NYMS' checking account number 6008244707 at Teachers Federal Credit Union (TFCU) routing number 221475786.

3. Resolved on June 3, 2021 by the Board of Managers of the New York Microscopical Society (NYMS): Whereas NYMS has funded and as of June 3, 2021 owns some number of certificates of deposit or similar financial instruments (CDs) with Columbia Bank (CB) NNN branch, we direct that Columbia Bank forthwith register, and deliver all testamentary document(s) in physical or digital format constituting and identifying such CDs and their terms, to the fiduciary care, control and management of NYMS' current Treasurer, John Scott, of 17 Battery Pl., Suite 1226, New York, NY 10004, and NYMS Managers Peter Diaczuk, of 345 Canaan Rd, Waymart PA 18472, and Louis Sorkin, of 14 Bobbie Lane, Rye Brook, NY 10573, NYMS' responsible persons for NYMS' CDs with Columbia Bank.

4. Resolved on June 3, 2021 by the Board of Managers of the New York Microscopical Society (NYMS): Whereas NYMS has funded assets and owns one or more Money Market account and/or other financial instruments (FIs, eg, MMA, etc.) Merrill Lynch NNN office (ML), we direct that ML forthwith remove as responsible persons all persons previously on record for NYMS' assets and accounts with ML, and that ML forthwith add as NYMS' responsible persons for the

fiduciary care and control of NYMS' assets and accounts with ML, NYMS' current Treasurer, John Scott, of 17 Battery Pl., Suite 1226, New York, NY 10004, and NYMS Managers Peter Diaczuk, of 345 Canaan Rd, Waymart PA 18472, and Louis Sorkin, of 14 Bobbie Lane, Rye Brook, NY 10573, NYMS' responsible persons for NYMS' assets and accounts with ML.

Current (March 23, 1983) NYMS Bylaws with areas related to Treasurer and Financial, Audit and Budget Committees highlighted:

<https://drive.google.com/file/d/1yV8HTWWXAzKJFqUBteQxDRdPyT3urnop/view?usp=sharing>

VOTE Called by President Jay Holmes and Seconded by Peter Diaczuk on Resolution #1: unanimously approved.

VOTE Called by President Jay Holmes and Seconded by Peter Diaczuk on Resolution #2: unanimously approved.

VOTE Called by President Jay Holmes and Seconded by Peter Diaczuk on Resolution #3: unanimously approved.

VOTE Called by President Jay Holmes and Seconded by Peter Diaczuk on Resolution #4: unanimously approved.

5. Optional NYMS Activities reports as time permits:

N/A

6. New Business

N/A

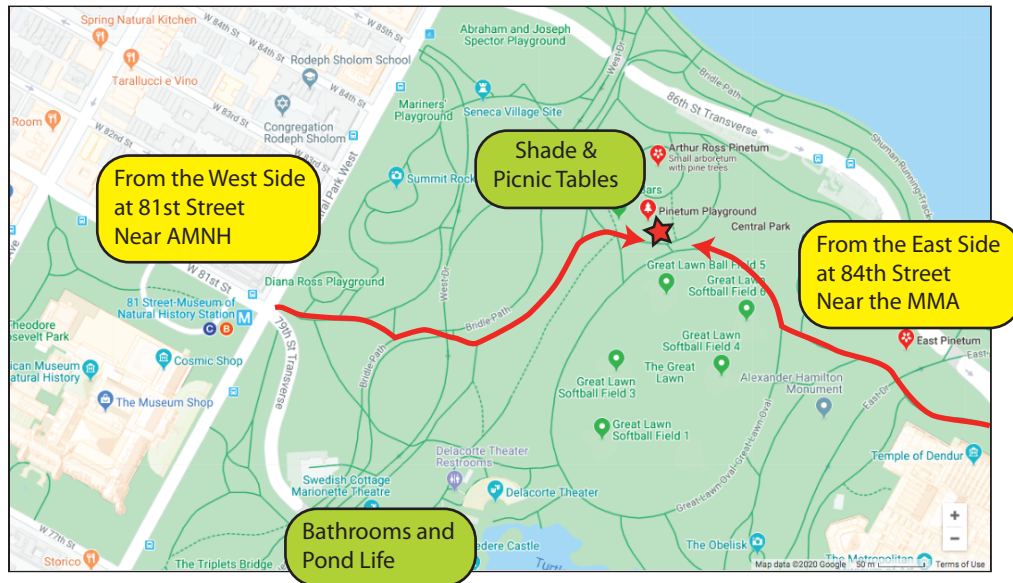
7. Adjournment at 7:22pm

Respectfully submitted



Brooke W. Kammrath, Secretary

Save the Date: NYMS Summer Picnic: July 25th!



Location: Picnic Grounds in the Arthur Ross Pinetum
in Central Park

Date: Sunday, July 25, 2021

Time: 11:00 am -3:00 pm

We have acquired a permit for a picnic at the Arthur Ross Pinetum in Central Park (map above) for Sunday July 25th, 2021!

We hope that this site will be accessible to all of our members:

- There are picnic tables (some of us will arrive early to secure some of those)
- There is parking on the streets and in garages in the area of the Museum of Natural History.
- There is a close Subway station at 81st Street
- The walks from 81st Street on the West Side and 84th Street on the East are fairly gradual with no stairs
- There are bathrooms available at the Delacort Theater
- There is a pond near by for potential microscope fun.

We are just getting started with planning, if anyone would like to get involved or has suggestions that would help us make this as accessible and as enjoyable as possible that would be wonderful.

Contact Jay Holmes at jholmes@igc.org



New York Microscopical Society Membership Form

Please type or print

Name: (Dr., Ms., Mr., Mrs.) _____ Nickname _____

Home Address: _____

City _____ State _____ Zip _____

Phone: (home or mobile) _____ Email _____

Work Information: Company Name _____

Work Address: _____

City _____ State _____ Zip _____

Work Phone: _____ Email _____

Would you prefer to receive NYMS mail at home? work? email (best way)?

Would you like information about NYMS committees? Awards Membership Education
 Library Finance Curator Facilities Program Publications History

Biography and statement of interests (optional)

In our society we share, and teach, and learn so please let us know a little about your principal interest in microscopy or any special microscopical skills you might like to share: _____

Date of birth (optional if over 18) _____

I have enclosed a check (made payable to "New York Microscopical Society") for \$ _____
to cover my membership.

Annual \$30, Supporting \$60, Life \$500 (payable within the year),
 Junior \$5 (under 18 years old) Student (over 18) \$20

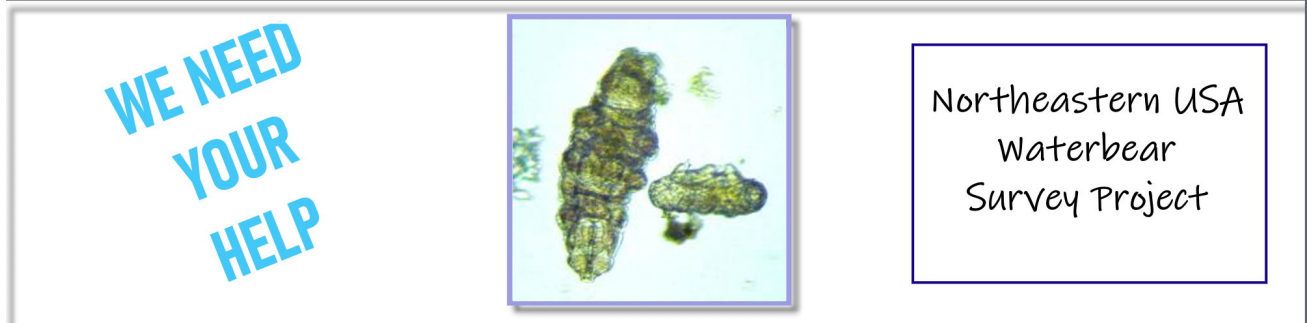
Corporate \$175 (includes one advertisement in NYMS News)

I understand portions of the above information may be used in NYMS publications.

Please send with payment directly to:

John Scott, Treasurer
New York Microscopical Society
PO Box 20098LT
New York, NY
10011-0008

YOU CAN HELP SCIENCE FIND TARDIGRADES



Dr. William Miller, Director of Research, Department of Biology and Chemistry, Baker University, Baldwin City, KS is conducting a biodiversity study with Mike Shaw (AKA The Space Bear Hunter), who hosted the video “First Animal to Survive in Space.” They invite you to join their new project to add data about the known and unknown species of tardigrades that live in the New England area (New York, New Jersey, Connecticut, Vermont, etc.).

MAKE A CONTRIBUTION TO SCIENCE

If you would like to participate, it is very simple. Collect habitat samples per the procedure below and send them to Dr. Miller at:

Dr. Miller, 3508 NW 52nd Terr, Kansas City, MO 64151 (at present during virus shut down) or

Dr. Miller, Department of Biology and Chemistry, Baker University, Baldwin City, KS 66006 (once confirmed open again)

WHAT HAPPENS NEXT?

Dr. Miller will personally hydrate your samples, extract the tardigrades, make slides and image your specimens. He will return an e-mail report about your contribution with a list of your species and a few pictures of your water bears.

Michael Shaw and Dr. Miller will accumulate the results and summarize in a future issue of Newsletter of the New York Microscopical Society. You will be acknowledged as a contributor. Michael Shaw will also make the data and images available on the USA website for tardigrades: Tardigrade.US

YOUR CONTRIBUTION TO SCIENCE

There are only 12 species of tardigrade documented from New York, 5 from New Jersey, 1 from Connecticut, and 6 from Vermont. This compares to 75 species in Alaska and Tennessee, or 56 in California. This is a tremendous opportunity to help document the occurrence of water bears in new places thus expanding the known range of each species and the biodiversity of the northeast in your state. We should expect about 50 species in each state but have no clue as to what combination of species (biodiversity) truly exists there or which species are relative to what environment (tree species or rock type). There is the possibility of discovering a species new to science.

PROCEDURE

Follow the collection process as described in the June 2020 issue of the NYMS Newsletter (Vol 34 No.2) in the article by Michael Shaw. (Contact Jay Holmes at jholmes@igc.org if you would like a PDF copy of the June 2020 issue of the NYMS Newsletter.)

All we need are three to five scrapings of lichen or a small sample of moss (with as little dirt as possible). Place each sample in a paper bag (not plastic) or envelope. Mark each with your name, date of collection, substrate (type of tree or rock from which collected), location address (we will convert to GPS Lat/Long) and your E-mail address for your report. Take a picture for your records. Drop all in a large envelope and send to the address above.

BONUS MATERIAL

In upcoming issues of the NYMS Newsletter you will find a new series called:

Basics of Tardigrade Identification

by Michael Shaw and William Miller

This is for those who wish to learn to essential characteristics that differentiate the Classes, Orders, Families and Genera of the many local species of tardigrades. Step by step, Miller and Shaw will present photos, diagrams and descriptions in a format that can be printed and assembled into a notebook to allow you to look at your own specimens with a growing level of confidence.

For those who wish to hydrate some of their samples, make a slide and view water bears under the microscope, Mike and William would like to discuss more elaborate projects such as temporal variation, exotic animals (marine or freshwater tardigrades), unique habitats, or experimental projects.

MORE QUESTIONS?

Mike and William are available to answer questions about tardigrades and projects.

William.Miller@BakerU.edu or mike@mikeshawtoday.com



The New York Microscopical Society is proud to support this tardigrade survey and excited to see what our members uncover in our own backyards, streets and neighborhoods! Visit us at <http://www.nyms.org> and follow us on Social Media for updates on this and other Society activities.

@nymicroscopical on Twitter, Instagram and Facebook
