MICRO-NOTES

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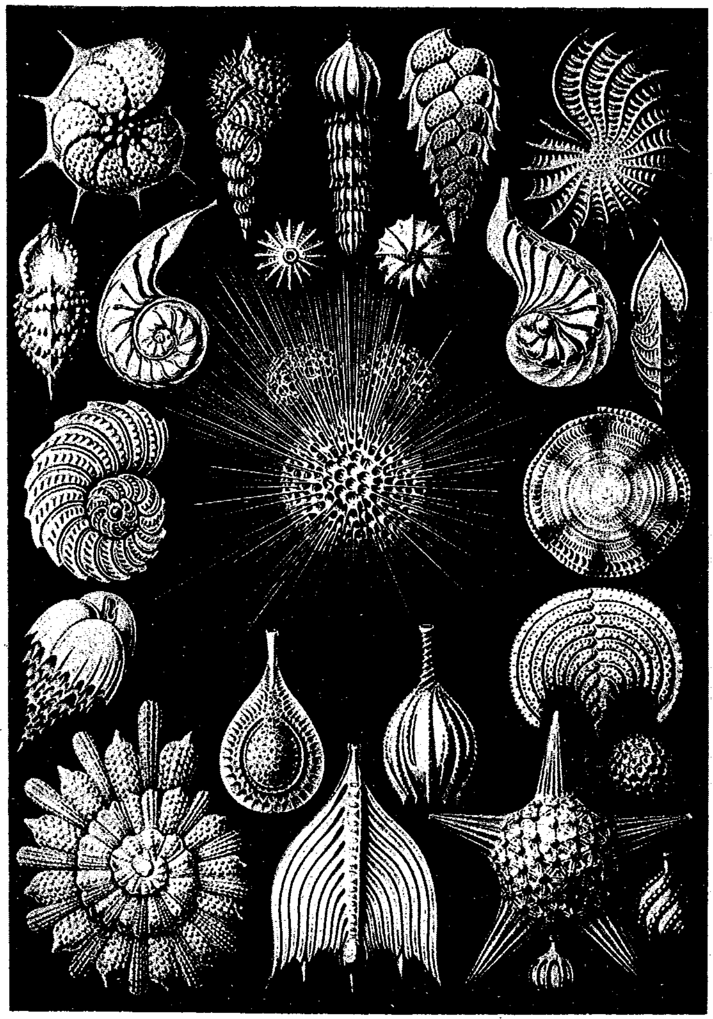

FORAMINIFERA
(See the text, page 12)

STATE MICROSCOPICAL SOCIETY OF ILLINOIS
(Founded 1869)
CHICAGO

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AFFILIATED SOCIETIES
American Society of Amateur Microscopists
Chicago Academy of Sciences

MEMBERSHIP FEES

Life membership	$50.00
Sustaining membership	25.00
Active membership	3.00
Corresponding membership	2.00
Junior membership (under 18)	1.00

MEETINGS

Regular meetings are held on the third Friday of the month; technical sessions on appointed days between these. The regular meetings always include a lecture, demonstration, motion picture, etc., by some noted specialist in this field. The Technical sessions are more informal gatherings of the members and their instruments to discuss technics, processes, discoveries, etc. and the novice is given helpful information and assistance by experienced members.

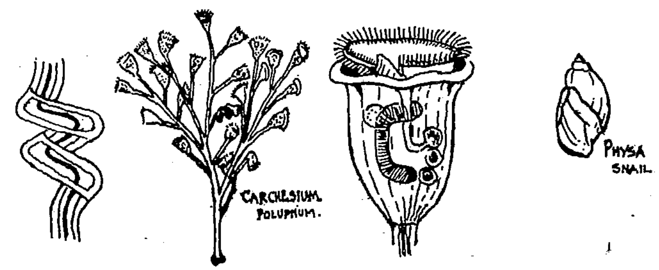
EDITORIAL OFFICES of the MICRO NOTES are located at 5517 DREXEL AVENUE, CHICAGO 37, ILLINOIS in care of Mr. J. E. Nielsen. For subscriptions contact Mr. I. J. Coldevin, 1123 NORTH STATE ST., CHICAGO 10, ILLINOIS.

MICRO NOTES is issued quarterly. It is free to members. For non-members the rate is 60 cents per year.

CARCHESIUM CULTURE
By J. E. Nielsen

An interesting observation which may be useful to our readers was reported sometime ago in Microkosmos.

A Physa-snail had accidentally fallen on the floor and its shell had broken. It was picked up and thrown into a battery-jar aquarium where debris and half dead plants kept company with Vorticello - and - Carchesium colonies. After the lapse of a few days the snail was taken out and found completely overgrown with colonies of Carchesium. Now a dozen Physa-snails was provided with damaged shells and thrown into the jar to see if the broken shell could really do the work. After a week's time, they all were thickly covered with Carchesium and all snails appeared to be in best of health except one that had passed out. The experiment was repeated several times, always with the same result, even in an aquarium where Carchesium was not known to be present.



Having thus procured some fine Carchesium cultures let us have a closer look of the animals. This, after all, was the purpose for which we have gone to the trouble of breeding such household pets. Under the microscope we note that they have the appearance of a flowering tree, completely alive. Every bell-flower is whirling and all the branches are swaying or jerking, making the water around them churn.

At the tip of each branch, a bell-shaped infusoria is attached and more than a hundred animals may thus be together in symbiotic partnership. When disturbed each animal separately will contract his branch into a spiral of one and one-half turn. If the stimulus is very strong, the whole tree will contract at once. Carchesium is distinguished from all other tree-like infusoria-colonies by this ability to contract its branches separately and individually.

The bell-shaped body is supported on a stalk. In the trough-shaped opening is located a lid, the Peristom, the edge or lip of which is carrying two rows of Cilia; these are usually in full activity churning food and water into the interior of the bell. The cilia-edged lip is continued as a spiral into the body with the only change that the outside row of Cilia is converted into a membrane, which forms a funnel-shaped vestibule at the end of which the mouth is located. The actual mouth is hence inside the body and directly connected with the protoplasm. From this mouth food is introduced into a small sac which when full cuts itself loose from the vestibule. At times, one may observe several such ball-shaped sacs or food-vacuolae floating about inside the body until the food is digested. The undigested parts are again eliminated into the vestibule from which they are emptied to the outside by action of the membrane.

Because water is taken in simultaneous with food, we also find present an organ serving as a kidney, this is the contractile vacuole.

Excess water and unused juices are eliminated by a rhythmic contraction and swelling of the vacuole, not unlike the pulsation of a heart. Besides these organs we also note the large U-shaped nucleus which together with the small nucleolus are, so to speak, housing the "soul of it all".

The stalk is hollow and contains a thin muscle thread which in the bell is split up into a bundle of fine fibres. When stimulated, the animal is, thereby, able to contract itself into a small ball simultaneous with the stalk being coiled up like a corkscrew and the animal thus brought out of a danger region. By the stalks elasticity it is again stretched out. This never-ending play of jerking, stretching, whirling and swaying hither and yon of an animal tree with so many animals, is a sight which it is difficult to cease looking at. It is an added enjoyment to realize that these animals are so small that they are only observable under the microscope. In spite of their smallness they achieve their object in life wonderfully well. The water between them and their surroundings is in constant whirling and churning motion, seizing everything in its giddy whirl; small algae, bacteriae and animaculae thus become defenseless prey and add to satisfy their always present hunger.

Much is still to be learned about these queer colony forming animals. Anyone interested in microscopy

and of diligent intellect can do much to promote further knowledge about them. Prof. A. Koeppel has a fine paper in Mikrokosmos XI p.62: 'Die Koloniebildenden Peritrichen' from which some of the above information has been translated.

VERMILION SEA OF CALIFORNIA

Dr. M. W. Johnson, Professor of Marine biology, gives the answer to the riddle of why the Gulf of California is called "The Vermilion Sea".

The real cause for the color of the water is not the silt coming down from the Colorado River, but rather the presence of billions of tiny microscopical one-celled animals, which are classified under the name 'Noctiluca' more specific 'Noctiluca miliaris'. Some of these produce light, hence the name Noctiluca. These are spherical protozoa, about one milimeter in diameter of a faint pink color and possess a single, short, thick, flagellum. When they float near the shores, often in inconceivable numbers, they give the ocean the appearance of diluted catsup. At night when agitated by the waves, the minute dinoflagellates emit tiny flashes of light, and the sea takes on a magic glow, appearing at times like a spectacular pyrotechnic display, especially when the waves strike partly submerged rocks or floating objects.

The Gulf of California is not the only part of the ocean which at times turn red. Dr. W. E. Allen, who was the Scripps Institution biologist*, described occurrences of red water, one in LaJolla Bay, and three along the coast of Washington. He counted as many as 3,000,000 individual dinoflagellates in a quart of water.

*Died 1947 - Age 73.

MORAVIA DEPOSIT

A card from J. Kinker, Amsterdam of November 11, 1884 makes mention of "something very new that has been discovered of Marine deposits of diatom materials in the midst of Europe"! Namely in Hungary and Moravia, containing forms that are met with in similar deposits in Central America - California, the Pacific Sea and so on, also new unknown forms. "It is intended afterwards to have them figured and described - and then I think they will be distributed more freely - now only very few possess them from the discoverer. They are said to be very difficult to clean well. It is a curious thing - throwing a new light upon Geological relations.

V.A.L.

WIDGETS and GADGETS

by Dan M. Stump.

No.2 - Method of Micro-measurement.

Many times it is desirable to obtain the measurement of various objects met in the course of routine observations through the microscope. Approximate overall dimensions of such objects may be readily obtained by means of a calibrated micrometer eyepiece with a ruled scale located at its inner diaphragm.

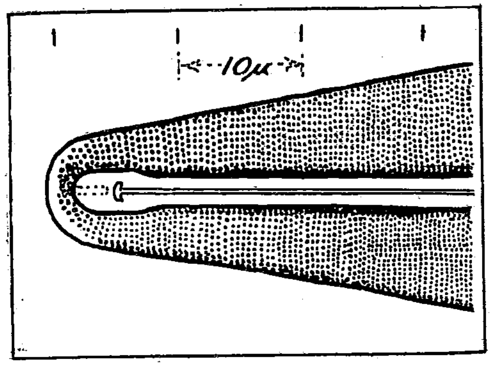
When more accurate measurements are required, they may be obtained by means of a carefully calibrated filar eyepiece micrometer, with a traversing spider-line actuated by a micrometer screw. This latter method calls for considerable skill in manipulation, and I have found its operation to be very tiring on the eyes, particularly when measuring the intervals of closely spaced structure, such as the markings of the finer diatoms.

A third method, prefered by many microscopists, is to make a photomicrograph of the object to be measured, and knowing the magnification at which the picture was taken, the size of an object on the print may be measured with a ruler and its actual size calculated.

A variation of this method is to make a separate photomicrograph of the rulings of a stage micrometer under identical conditions of magnification, and use the print showing the enlarged rulings as a scale to measure directly the true size of the object.

Another and more accurate variation of the photographic method, that I prefer to any of the methods already described, is to make a single photomicrographic negative showing not only the object to be measured, but also showing a narrow scale along the edge of the same negative indicating some unit of measure, say 10 microns, at that magnification. The final measurement of any part of the object shown on the photomicrograph may then be readily determined by making a direct comparison with the known intervals of the superimposed scale.

To obtain such a negative showing the object and the magnified scale simultaneously, I use an open backed plate holder, into which is first placed a clear plate of selected glass bearing a row of opaque markings along one side of its inner face. These markings were cut into the glass, spaced by direct comparison with the image of the rulings of a stage micrometer projected onto the glass, and accurately indicating actual units of measurement at that magnification.



The plate holder is loaded, in the dark room, with a piece of cut film, emulsion side down and in direct contact with the markings on the glass plate. Both plate and film are then held in position by the clamping action of the back of the plate holder.

The exposure is made in the conventional manner, except that it is made through the glass plate held in direct contact with the photographic emulsion. The resulting negative and all subsequent prints will then show the enlarged image of the object superimposed on a scale indicating its true size.

A differently marked glass plate will be required for each different magnification used, as produced by various combinations of objectives, tube lengths, eyepieces, and camera bellows draw. However, unless unusually versatile in his work, the average microscopist will find that not more than two or three such plates will suffice for all requirements.(It should be noted that if an objective with a correction collar is being used, different magnifications result at different settings of the collar.)

By this method, as described, we eliminate any possible errors due to the unpredictable shrinkage of either the photographic film or paper during processing, both of which are considerable in actual practice, This method also permits the enlargement of the final print to any convenient size and magnification without affecting the relative size of the scale and the object, which will remain constant during any enlargement or reduction.

With reasonable care to maintain conditions identical with those under which the markings on the glass plates were originally prepared, the accuracy of the final results by this method will compare very favorably with those obtained by the <u>expert</u> use of a filar eyepiece micrometer. The convenience of making the final measurements of closely spaced structure by this method, as compared with the eye racking observation through a filar will be obvious to all who have subjected themselves to that ordeal. The described method provides the added advantage that a permanent record is provided, available at any future time.

DIATOMS AND OYSTERS

From our good friend, J. Bartholomew, we have interesting news. Together with Dr. Hopkins, he is now engaged in oyster research at Biloxi, Miss. It seems that this bivalve delicacy is on the way out,or at least rapidly decreasing in numbers at this locality which is economically, as well as gastronomically, a great loss to the citizenry at large. It may be possible that polution by waste water from Freeport Sulphur Co. is the cause of the oyster demise; however, it may also be possible that there are other causes, hence, this research project.

One reason for which this project is most interesting to microscopists is the fact that young oysters find their main food supply in plankton of which diatoms are the most prominent inhabitants. One may almost say no diatoms , no oysters. Some curious observations have been made in this respect. Mr. Bartholomew reports that the Menhaden (a surface feeding fish of the herring family) is quite a consumer of **diatoms**. He writes as follows: "You will probably be astonished to know that a 200 millimeter **beaker** of Menhaden intestines will frequently yield, after cleaning 25 millimeter of diatoms. Years ago, I thought I was a collector but my hat is off to the Menhaden."

"It is possible to set up an oyster control under laboratory conditions, feed him for 24 hours in natural seawater rich in plankton, take him out at the end of the period, scrub him, sterilize him and put him into filtered sea water and let him deficate for 24 hours and then make complete diatom studies of what has actually passed through his intestines. These angles of course fascinate me. Of the 60 odd genera and perhaps 100 species, common in townet-takes and the studies of the mud bottom, darned if the little brat does not confine himself almost wholly to Melosira, several species Cosciusdiscus, goodness knows how many varied species and Navicula - virtually all the strictly linears he rejects and even among the Navicula will only pick the nearly oval shapes. Also in studying sizes, if the Cosciusdiscus, for instance, will average a hundred to one hundred and fifty microns in natural sea water, the little skunk will ingest nothing beyond 50 or 60 microns. We are now ready to set up pure cultures in Miguel solution and grow the genera and species that the oysters accept. We will then treat the cultures in various percentages of bleedwater to see how it affects the growth of the diatoms themselves."

Mr. Bartholomew is inviting our diatom interested readers to cooperate with him in this project, particularly the taxonomitical assistance would be helpful. If

you feel you can be of help, kindly contact J. E. Nielsen, 5517 Drexel Ave., Chicago 37.

J.E.N.

BOTANICAL POSSIBILITIES OF CHICAGO REGION
By Floyd Swink

Many people are under the impression that the Chicago region is a comparatively poor place to study plant life due to its great industrial expansion, with the resulting decimation of many native species. While there has been a diminution of many such species, the actual number of species has increased during the last century. A complete check list taken at the present time would indicate about 1,900 species of flowering plants in the Chicago region,considering that that area should embrace the Indiana dune region and the new state park north of Waukegan, and going as far west as the Fox River.

Let us consider an area of approximately equal size in the Rocky Mountains of Colorado - a region long noted for its botanical possibilities. In this area we **can** include the Rocky Mountain National Park, and a territory of about equal size, completely surrounding the park. In this region are found less than 1,000 kinds of flowering plants in an area just as large as Chicago and vicinity. Let us analyze 2 basic reasons for this difference in figures.

First, Chicago is the world's greatest railroad center. A number of plants native to the vast Great Plains region have, therefore, been distributed by trains and have found very suitable habitats in our territory. Impure lawn seed accounts for a goodly number of introductions. There are many activities of man, in altering the earth's surface, which are considered to be directly responsible for other introduced species. On the other hand, the Rocky Mountain region above mentioned is relatively little disturbed, and there is much less opportunity for plant introductions.

Secondly, Chicago is located at the critical junction of several well-marked botanical areas. It is at the eastern terminus of the noted prairies of the Midwest, and is at the western edge of the beech-maple type of forest of the Eastern states. Also, it is near the southern tip of the sphagnum bog type of habitat so common in the North Woods and Canada, and which contain so many interesting plants of the heath and orchid families. Coupled with this, the location of a portion of this area at the southern tip of Lake Michigan has resulted in the formation of a remarkable series of sand dunes, which support a flora uniquely different from other Midwestern areas.

In contrast to these factors, the Rocky Mountain region of which we speak is located in only one general botanical area -- that of the coniferous forest. The factor of altitude, however, divides this region botanically into the montane, sub-alpine, and alpine zones, which accounts for a greater variety of plant life, but does not add as many species as might be imagined.

In conclusion, therefore, let us not feel that we must leave home, and visit some foreign country or a national park to secure the desired diversity in plant life. There is enough here to keep anyone busy -- and plenty more. All we need to do is get out into the field, and keep our eyes open.

ON EFFECT OF PENICILLIN ON SEED GERMINATION

The substances present in therapeutic penicillin, which cause inhibition of germination and root growth are represented by the indole-3-acetic acid type of compound. Since this and phenylacetic acid were known to be present in the penicillin tested, it is concluded that they are responsible for the inhibition activity against seeds. None of the crystaline penicillins tested appreciably retarded germination according to Walton J. Smith, Science #2705 p. 411.

STREPTOMYCIN

Besides Penicillium - Streptomycin aids horticulture by killing pear, carrot and bean blight, tomato canker, potato scab and some leaf spot diseases. A Californian scientist thinks it may prevent seed borne bacterial diseases of some farm crops. The need to produce these moulds and lower costs are a chemico biological problem as is the microscopic study of the histogy of plants and their diseases.

ON TAXONOMY

Z. P. Metcalf, Univ. of North Carolina, writes in Science #2701, p. 329: No one seems to have a very clear conception of the enormous number of species of animals living in the world today. An actual count of genera and species of Homoptera in the card catalogue of this order of insects in my laboratory shows that there are approximately 3100 genera and 30,000 species recorded. Perhaps from these counts of the number of species of Homoptera we may be able to get a real estimate of the number of species of animals that have been described. From various counts and estimates, I believe that the Homoptera represent from 1/100 to 1/150 of the Animal Kingdom. This would give us an estimated total of 2,500,000 species of animals already described, of which 1,500,000 are insects.

FIELD - TRIP REPORT

The State Microscopical Society held its annual field trip on June 22, 1947.

The trip was made to Miller, Indiana, which is located in the eastern section of Gary. This region is remarkable for its shifting sand dunes, between which are located shallow ponds. These ponds have a high alkaline content, as is shown by the great number of calcophilous plants that inhabit them. Among these are the bog arrow grass, short-headed rush, beach rush, brook lobelia, horned bladderwort, and golden sedge. The blue-green alga Nostoc is also very abundant here.

In olden times, the region was drained by the Grand Calumet River, but due to man's influence the rate of flow has been almost completely stopped, causing the river's mouth to close some distance from Lake Michigan. This condition has formed a lagoon which is unexcelled for water life. At least 15 species of pondweeds, as well as several bladderworts, eel grass, pickerel weed, several rushes, and waterweed grow profusely in this blocked-off river. The appearance of the dense growth of these water plants at a distance of several feet below the water gives a very beautiful effect, especially in bright sunshine. Of course, such a combination of factors brings about a paradise for the microscopist, and the collecting that day was excellent.

The more stable dunes support a wealth of plant life - and at time of the trip the lupine, coreopsis, sandwort phlox, spiderwort, and puccoon helped to make the region gay with color.

Floyd Swink

THE SOCIETY'S ANNUAL ELECTION

The Society held its annual election of officers on Friday, January 16, 1948. Mr. Sam Levin, who has been affiliated with the Society for many years, was elected president. We wish to thank our past president, Mr. Alfred Herz, for his faithful service in spite of working under difficulty due to his wife's illness. We are also pleased to report that Mr. Nielsen is feeling much better after his serious illness, and this contributor wishes to take this opportunity of thanking him for his untiring efforts in editing and publishing Micro-Notes in spite of the fact that his health is still not upto par.

Floyd Swink

TECHNICAL SESSIONS

For a number of years the State Microscopical Society of Illinois held two meetings each month during the meet ing season. One meeting was held on the third Friday of the month and was of the more formal type. The other meeting was held on the first Friday of the month and was of a more informal nature. We called the latter meetings "Technical Sessions".

At these Technical Sessions, the members and guests grouped themselves around the microscopes, studied stain ing techniques, prepared slides and discussed matters of common interest. A grand time must have been had by all since old-timers always came back for more and brought friends with them.

To the Society's great regret, these sessions had to be discontinued. There were several reasons for it, which possibly could be traced to the war. The officers and trustees of the Society have been longingly looking forward to the time when these sessions could again be held as a regular feature of service to members and guests.

Only now has an opening been found. A most promising arrangement is in the making and study subjects are already under consideration by those who will be in charge of these sessions.

A good feature about the new arrangement is that from time to time these Technical Sessions can be held at pro minent points away from the "Loop" and at more convenient hours. But this is not the whole story. The prospective arrangement will permit regular classes in microscopy to be held even weekly. Beginners and the more advanced can be better served and faster advanced in the several branches, in the use of the microscope.

I.J.C.

OUR FRONT PAGE

We have reproduced on our front page a plate (Tafel 2) found in KUNST FORMEN der NATUR by ERNST HAECKEL (1899 - 1901). This work by Professor Haeckel has one hundred plates in execution, similar to the one reproduced by us.

It is, indeed, a joyful experience to study these illustrations. In doing so, good use can be made of its descriptive supplement where pages 48 to 51 are especially helpful.

The call number on KUNST FORMEN der NATUR is in the John Crerar Library, Chicago:-L745 H11, Vol. 1, Vol. 2, and supplement.

BOOK NOTES

1. PATTERNS FROM NATURE. Photographs by H. P. Horst, J. J. Augustin, New York, 1946, xii & 108 p. $10.00.
2. FORAMINIFERA, Their Classification and Economic Use. Third edition, revised and enlarged, with illustrations and an illustrated key to the genera. By Joseph A. Cushman, Cambridge, Mass. Harvard Univ. Press, 1940. vii p., 535 p. incl. illus., 79 pl. diagrs., Bibliography: p. 335-394. $6.00.
3. PURE CULTURES OF ALGAE: Their Preparation and Maintenance by E. G. Pringsheim University Press, Cambridge, 1946. xii & 119 p. $1.75

TIMELY WORDS

"-----it is far better for anyone who is merely interested in the wonderful and varied forms of living things to be seen between tide marks to seek them out and to watch, and then to leave them behind in their natural haunts. There is much to be seen and learnt by quietly watching by the side of a rock pool or by taking note of the way in which the different species are distributed over the shore. ..... The amateur marine naturalist can enjoy to the full many hours on the shore without ever needing to take away with him the animals he has observed." p. 44 in "They Live in the Sea" by Douglas P. Wilson, Collins, London, 12 s. 6 d, - 128 pp., ill. 1947. The book is a collection of excellent photographs with an accompanying text.

MEMBERS OF GUESTS INDICATE THEIR INTEREST

At our meetings, members and guests record their names on cards or lists and often state what subjects, interest them the most.

Reviewing this material, we find that the following expressions have most commonly been used: -

1. Technique in general
2. Microbiology
3. Botany
4. Zoology
5. Diatoms
6. Insects
7. Bacteriology
8. Histology
9. Embryology
10. Chrystalography
11. Chemical Microscopy
12. Industrial Microscopy
13. Criminology
14. Photomicrography
15. Optics
16. Electronics

ATMOSPHERIC PRESSURE

At sea-level, the pressure of the atmosphere is found to be 14.7 lbs. per square inch or 1033.6 gms. per sq. cm. Roughly speaking, this we may say is equal to 15 lbs. per sq. in. or 1 kg. per sq. cm. This pressure is termed one atmosphere.

A MARTIN ACHROMATIC MICROSCOPE
by Frank J. Kelley, Philadelphia, Pa.

While telescopes were achromatized as early as 1733, most works on the subject date the first efforts to do this for the microscope as later than 1800, culminating in Chevalier's and Tully's objectives about 1923.

But there was an earlier achromatic microscope although of but low power, for in 1771, Benjamin Martin published a pamphlet describing a Microscopium Poly-dynamicum on the title page of which is stated - "Also the Method of Constructing a Microscope of This Kind With One Achromatic Lens Only." Opposite the title page is a plate containing a diagram of this miscroscope showing the lens to consist of a double concave between two double convex units.

In the latter case, Martin explains that this lens is one used as an objective in an achromatic opera glass. Following are pertinent extracts from his rather profuse further explanations:

"Now the very same Achromatic Lens, if applied in the preceeding construction, will become the Object-Lens of an Achromatic and Polydynamic Microscope; and which will magnify in every degree from 8 to 40 or 50 times."

"But a Power of Magnifying 40 times will be found full sufficient to give a most delightful view of all small objects in general as the Aperture here exceeds that of a Common Microscope as much as it does a common-Telescope, being 3 to 6 tenths of an inch."

To get an idea as to the performance of such a lens I fitted a very old opera glass lens, such as Martin described with an aperture of 5/8 inch, so it could be used as an objective and compared it with an old non-achromatic objective. Both were worked at a magnification of 40 diameters, the highest that Martin recommends using a Tolles 1/4 inch solid ocular with the opera glass lens and a 2 inch Huygoniass with the non-achromatic. The former gave good view of Triceratium farsias and proboscis of blowfly, including the servations of the pseudotrachea, while the latter failed on both tests. In fact, the superiority of the achromatic was so marked that it is difficult to understand why more than thirty years were allowed to pass before further efforts were made in the same direction.

LIVING ORGANISMS UNDER HIGH PRESSURE
by J. E. Nielsen

The effect of extremely high pressures on living organisms has been studied at the Research Foundation Laboratories of Armour Institute of Technology. Here pressures of 1,500,000 pounds per square inch have been developed. Such pressures are not common in liquids or **gases** but are of the order of the pressure at the center of the earth which is estimated to be 3,200,000 atmospheres. In space they occur probably daily when meteoric matter, traveling with velocities of 30 miles or more a second, strikes the upper layers of the earth's atmosphere.

It was observed that a pressure of 12,000 atmospheres is necessary to kill bacteria. Bacteria are one of the simplest forms of life, and as may be expected, lesser pressures are required to destroy more complex organisms. It is expected that because of this selective effect, important deductions may be made in combatting certain pathological cases. Such forms of microscopic freshwater life as Hydra and Planaria, were found to withstand pressures from 10,000 to 20,000 pounds per square inch without any serious damage. The effect of the high pressures was to precipitate some of the colloidal constituents of the organism.

Chemical reaction between various substances was also observed under extreme pressures. The reaction between sugar and water was found to decrease with increase in pressure and the chemical reaction between hydrogen and sulfuric acid to give hydrogen sulfide and water. Non-sporagic bacteria do not resist above 5,000 at. On the other hand, spores and in particular those of Bacillus subtilis are able to resist pressures over 18,000 at. for a duration of 45 minutes. Evidently high pressures provide less protection against germs than other means of sterilization, such as boiling. Viruses reveal themselves as much less resistant to high pressures. At 1800 atmospheres the influence is noticeable and at 4500 at. the inactivity is complete. It is hence possible by this method to differentiate between virus and diastose.

Bacteriophages are totally inactive at a pressure varying between 2000 and 7000 atmospheres. Certain proteins, such as globuline of serum and egg white coagulate at high pressures but the albumine serum does not. A long series of research of utmost importance was interrupted by the war; in the first line of these was coagulation experiments on the colloidal fluids of cancerous cells.

Important research along these lines is progressing after the interruption caused by the war.

OBITUARY

We regret to announce the death of the wife of the late John A. Long, last February,1947 after a short illness. As known to diatomists all over the world, Mr. Long was one of the most skilled and generous workers.

Mrs. Caroline Booth,wife of one of our older members, the late Henry Booth - lawyer, died in late Fall of 1947. She donated microscope and outfit to our Society.

SIR HERBERT JACKSON

Sir Herbert Jackson was born March 17, 1863, and died December 10, 1936 as Emeritus Professor of Chemistry, University of London. The Professor was a most skillful microscopist and an especially fine judge of high-powered lenses.

His knowledge of chemistry, combined with his deep interest in the microscope, led him to study the production of optical glasses. As a result, he brought out a number of formula for the making of the many kinds required in the modern microscope and other scientific instruments.

Several new methods of illumination were also introduced by him. For example, by the use of polarized light and dark-ground illumination,he was able to analyze quantitatively and also reproduce ceramic glazes and colored glasses found only in pre-historic and Egyptian excavations. As another example,we may mention his examination of diatoms between crossed-nicol prisms. Here he showed that a dark ground illumination was formed by the depolarization produced by the fine structures of the diatom. Likewise, by the microscopic examination of the colors produced by difraction in samples of particles thinly distributed, he was able to estimate their size.

His death deprived microscopy of a worker difficult to replace.

V.A.L

EDITORIAL

With this issue, we are starting on the third year of MICRO NOTES. The many favorable comments heard in regard to its publication, have encouraged us to increase the number of pages from twelve to sixteen for each quarter issue. We hope, thereby, to be able more nearly to approach the goal we have set --- to bridge the gap between the specialized research worker and the serious amateur.