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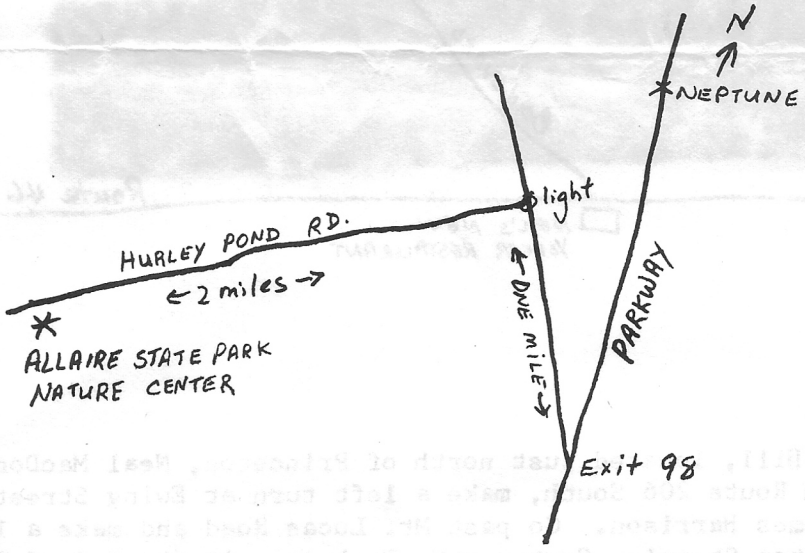
New Jersey Mycological Assn.

Worthington

The August 3rd foray will be near the Delaware Water Gap at the Worthington Tract. Directions: Take Route 80 west. Exit at the Delaware Water Gap National Recreation Area exit (still in N.J.) and proceed to the second parking lot at Dunfield Creek. John Durkota will lead this 10:00 a.m. foray.

Allaire

Allaire State Park Nature Center is the site for the August 10th foray. This is in a different area than Allaire State Park, so please follow these directions. Directions: Take the Garden State Parkway to Exit 98. The sign is marked "Allaire State Park, Route 34 North & Monmouth Airport". Follow the sign to "Route 34 North" (Do not follow sign to Allaire State Park.) Go one mile and at the light make a left on Hurley Pond Road. Travel two miles to Allaire State Park Nature Center. The foray begins at 10:00 a.m.



Stokes

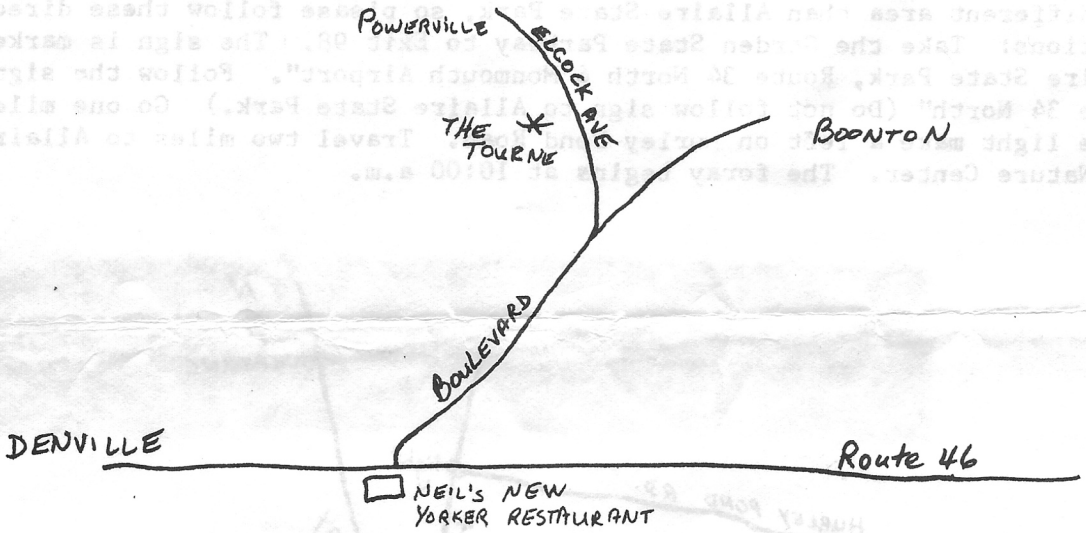
Stokes State Forest is the scheduled foray for August 17th. Stokes is in the extreme northwest portion of the state. Grete Turchick is the leader, 10:00 a.m. Directions: Take Route 206 north. The park entrance is about five miles north of Branchville on the right. Follow the road past the Forest Office, make the first right, and then the first left onto Coursen Road. Proceed two miles. We will meet at the Kettle Field parking lot which is near the ball field.

NORTHEAST FORAY

The annual Northeast Foray will be held August 22-24 in Vermont. More information can be found elsewhere in this newsletter. Directions and additional information will be sent to those who register.

THE TOURNE

On August 31st, Dorothy Smullen will lead the annual Hiram Korn Foray at the Tourne park in Boonton. Hiram founded our club and the first foray was held at this park. This is a joint foray, with members of the New York club attending.
Directions: The easiest access is by way of Mountain Lakes Boulevard, which is opposite "Neil's New Yorker" restaurant on Route 46, between the Cherry Hill and Denville exits of Route 80 . Take Route 80 to either of these exits and proceed on Route 46, continuing in the same direction from which you came. Take Boulevard north for approximately two miles. At the first fork bear left onto Elcock Ave. towards Powerville, for about two blocks. The entrance to the park is on the left. We will meet in the second parking lot at 10:00 a.m.



SEPTEMBER FORAYS:

Sept. 7 - Autumn Hill, located just north of Princeton, Neal MacDonald leader.
Directions: From Route 206 South, make a left turn at Ewing Street just before town. Ewing street becomes Harrison. Go past Mt. Lucas Road and make a left turn just before the Princeton Shopping Center onto Terhune. At the end of Terhune, make a left onto Snowdon and go past the Herontown woods. At Herontown Road, make a left. The parking lot is about three blocks up on the right.

Sept. 14 - Poricy Park, leader Pat Contreras.
Directions: Take the Garden State Parkway to Exit 114 (Holmdel-Middletown). Coming from the north, at the end of the ramp make a left onto Red Hill Road; from the south, make a right at the end of the ramp. Take the first right turn which is Dwight Road and stay on this road 1½ miles to the first stop sign. At the stop sign turn left onto Middletown-Lincroft Road. Continue for ¼ mile, then turn right onto Oak Hill Road. The nature center is on the right immediately before the second set of train tracks.

TAXONOMY

The Taxonomy Committee will meet Saturday, August 16, 10:00 a.m. to noon. Call Dorothy if you plan to attend, 647-5740. Bring a lunch and stay for crafts.

NAMA FORAY

Several members are planning to attend the NAMA J.N. Couch Foray in Tuxedo, North Carolina, Sept. 18-21. This area is reputed to be one of the best collecting areas in the eastern U.S. Included in the foray are mycophagy and taxonomy sessions, exhibits and photo seminars. Those attending may wish to chip in for bus transportation or car pool to and from the foray. If interested, contact Jim Richards.

FUNGI FEST

Anna Gerenday, fair chairperson, has been busy planning the day long Fungus Fest '80 to be held at SCEEC on October 12. Although it sounds early, much preparation is necessary for the fair to run smoothly. Members are needed to work at the fair, and others to work before the fair. The club will be selling arts and crafts. Two sessions have been scheduled to work on arts and crafts, signs, posters, decorations, etc. The sessions will be at SCEEC on Saturdays, August 16 and September 13, from 10:00 a.m. to 3:00. If you would like to help with the arts and crafts, call Bernice Fatto, [redacted] Members wishing to sell their own mushroom items at the fair should also contact Bernice so space can be allotted.

Volunteers are needed to lead mini forays at the center, work at booths or act as hosts and hostesses at the Fair. If you have any ideas on the fair, come to the board meeting August 6th, or call Anna, [redacted] after August 11th, with your suggestions or availability to work.

An Evening in Mycological Microscopy -- with Mycenastrum corium for a Nightcap

by Dr. Leo J. Tanghe

(Author's note to readers: this was written primarily for microscope-oriented mycologists; others will find much of it unintelligible.)

(Editor's note: I disagree.)

Ed and I went out collecting mushrooms last Sunday (6/29/80).

Dr. Edwin Kriedemann is a physician in the village of Pittsford, just east of Rochester. We have been out many times collecting mushrooms, and have spent many evenings together studying them over the past 10 years.

We went to Powder Mill Park in the southeast corner of Monroe County and took a favorite walk about a mile eastward from Wadham's Cabin along a nice path through the woods, with a stream on the south and a steep slope on the north. My wife and son came with me, and Ed brought a companion, making a group of five.

The collecting was good. We gathered 40 to 50 species, including eight collections of Crepidotus, and nice finds of the sulfur mushroom (Laetioporus sulfureus) and the ink cap (Coprinus atramentarius) for the cooking pot. When we got back to the car after a walk out along the stream and a walk back along the crest of the ridge, Ed said:

"How about a session tonight, Leo?" I hesitated.

"Well, today is our 45th wedding anniversary and we are going out to dinner. I can make it, but it will have to be a little later than usual." Ed was very considerate.

"I wouldn't want to cut short your celebration. How about Monday night?"

"Monday nights we usually go swimming, " I replied.

"Then how about Tuesday? The specimens will keep in the refrigerator." I agreed. As soon as we got home I put portions of caps of mushrooms on microscope slides for spore deposits. I like spore deposits on slides. They are uniform and free of debris and they usually don't move around much in the mounting medium. I put 21 specimens for spore deposits in a large photographic tray, numbered them, and put the corresponding number on the rest of each collection for storage in the refrigerator. I put a dish of water in the tray and covered the tray to maintain humidity.

Seven of the eight specimens of Crepidotus gave good spore prints and I recorded the shape and dimensions of them before Ed came. I also took scalps to examine the epicuticular hyphae for clamps. When I first got Hesler and Smith's Crepidotus book and found that the first step in identification was to determine the presence or absence of clamps in the epicuticular hyphae (page 20), I felt like sending the book back. But this is really a very simple step. Just take the thinnest possible scalp from the surface of the pileus with the sharpest possible razor -- I like to use a new single-edge razor blade -- and look at it under the microscope. If clamps are abundant there is no problem in finding them; if they are rare or absent, it takes a little patience to make sure.

So when Ed came at 7:30 on Tuesday night I had eight collections of Crepidotus lined up on the table with notes on spores and clamps. We selected one with elliptical spores and no clamps. This puts it in the subgenus Crepidotus. The key to this subgenus quickly led to sections Crepidotus and Versuti depending on whether or not the cuticular hyphae were gelatinized. I It was difficulttto make a choice. In making the radial section for microscopic study the layer of epicuticular hyphae (which were large and distinct, slightly colored, and some of them encrusted) easily sluffed off, and the layer beneath it was very rubbery and flabby, giving everyindication of being gelatinous. I make all my sections with the aid of a zoom stereo microscope at about 10x magnification. Under the conventional microscope at 400x this layer measured about 200 microns thick and was composed of interwoven hyphae under 3 microns in diameter. These hyphae were distinctly outlined and well separated and did not give the appearance of being gelatinous, but then I realized that they must be suspended in a gelatinous medium.

The key to species in section Crepidotus (page 26) quickly led to Crepidotus molis molis since there were no pleurocistidia. I have had Crepidotus molis many times before and have observed the very thick gelatinous layer in the cuticle, but I still cannot identify it for sure in the field.

The next Crepidotus had a snow-white pileus, globose spores, clamps in the epicuticular hyphae, and cheilobut no pleurocystidia. We quickly identified it as Crepidotus malachius malachius.

The remaining Crepidotus all had globose spores and clamps in the epicuticular hyphae, but they were all quite mature and we had no way of knowing whether the pileus was at first white or colored, as required to separate the subsections of the section Sphaerula (page 40), so we turned our attention to other things.

About that time my son brought down tall glasses of ginger ale and ice, and some crackers and cheese. We used to drink stronger stuff, but Ed has sworn off. He feels a lot better, he says.

"Ed, I'd like to show you the two-spored basidia in Clavulina cristata." I had gotten a good spore print from this coral mushroom yesterday and had seen the two-spored basidia. I quickly made a transverse section near the tip of the spine and put it under a microscope. The two curved sterigmata showed up beartifully on many basidia. This characteristic separates Clavulinas from the rest of the coral mushrooms.

I had also gotten a spore print from Polyporus Tulipiferae. This polypore was growing mostly in a resupinate position, and it had a very uneven, toothed, pore surface. I set this up under the stereo microscope at 10x for Ed to see. The pore surface was quite striking in appearance with oblique illumination.

We next turned our attention to a tiny Mycena which I had never collected before. It's pileus was only about 5 mm. in diameter, scarlet red in the center, fading to orange to yellow towards the margin. From the key to sections in Smith's Mycena book (page 60) it fell readily into section Deminutivae. This is a big section and the keys to it extend over three pages. We needed to know the appearance of the cheilocystidia to make choice #24 in the key on page 78. We readily found cheilocystidia in the gill section; they were fusoid-ventricose rather than clavate-roughened. This led quickly to an identification as Mycena acicula, even though our specimens we were too immature to provide any spores. We verified

the identification by the presence of inflated cells in the cuticle.

It was getting along about quarter to eleven and I said to Ed:

"We should look at that puffball you showed me last Sunday." I had stored it in the refrigerator until Tuesday. This puffball, about 7 cm. in diameter, had large aerolate patches all over its surface. Ed had cut it in two and saw saw a very thick (2 mm. or more) skin, and no sterile base. From Smith's Non-Gilled Fleshy Fungi he had tried to fit it into Section Pachyderma of Calvatia.

"Let's look at some of the goop," I said. I couldn't think of the technical word, gleba, right at the moment. I was amazed at what I saw under the microscope. The spores were globose, about 10 microns in diameter, with a slightly roughened perimeter and a feebly reticulate surface. There was nothing like this in Calvatia. We tried to Fit it into Scleroderma, but this genus, according to the literature has hardly any capillitium (a network of long hyphe in the gleba).

Our specimen had a very definite capillitium, characterized by numerous sharp spines like the thorns on a rose bush. I had never seen anything like it before and thought it should be a cardinal point for identification.

This proved to be the case for Mycenastrum corium, which we found described in several books:

Smith's Non-Gilled Fungi
Smith's Puffballs and Their Allies in Michigan
Mc Ilvain's One Thousand American Fungi
Coker and Couch's The Gasteromycetes of the Eastern United States and Canada.

I got a chuckle out of Mc Ilvain's last sentence about it: "No report upon edibility. Probably good."

"Let's look it up in the Czech book and see if it is in there." I was referring to Pilat's Gasteromycetes, my only mushroom book in the Czech language. Pilat had sent me a copy of this book in appreciation of some pictures I had taken of him and others at a mushroom symposium in Knoxville, Tenn. in 1968.

Sure enough, it was described in great detail in Czech and briefly in Latin. He describes the spines on the capillitium as "processibus acutis, 7-17 microns longis".

We adjourned at 11:15, Ed and I each telling the other that this was the bestevening of mushroom study we had ever had!

NORTHEAST EVENTS

More information has been released on the Northeast Foray in Bennington, Vermont. Bob Peabody, committee member responsible for contacting professionals, has assembled a panel of experts to lecture and positively identify specimens found on the foray. The professionals, representing a variety of specialized areas, include Dr. Alexander Smith as senior foray mycologist, Dr. Margaret Barr Bigelow and Dr. Howard Bigelow both of the University of Massachusetts, Dr. Ken Harrison of Arcadia University in Nova Scotia, Dr. Richard Homola of the University of Maine, Dr. Tim Baroni from Farlow Herbarium at Harvard, Barry Wulff from Eastern Connecticut State College, Dr. Ken DuMont of the N.Y. Botanic Garden, Dr. Carl Wolfe of Penn State, Dr. Sam Ristich, Dr. John Haines and Gary Lincoff.

Dr. Geoffrey Kibby will be coming from England, and 8-10 Mycologist-Pharmacists from Nancy, France will attend. Other possible attendees are Dr. Rene Pomerleau of Quebec, Dr. Sam Mazzer of Kent State, and Dr. Josiah Lowe, a polypore expert from Syracuse.

A fantastic mycophagy session is planned with Grete Turchick participating. Two of the lectures include Charles Coffill on Microphotography and Bud Schwarts on the genus Pilobolus.

NJMA has volunteered to coordinate the ID tables. Those in our club who are attending, please see Dorothy Smullen about your availability to work at the tables.

Registration is filling up fast, so those interested in attending should immediately send in their registration.

What Is A Species? BY DAVE PATTERSON

"The term species thus comes to be a mere usless abstraction, implying and assuming a special act of creation"--"from these remarks it will be seen that I look upon the term species as one arbitrarily given, for the sake of convenience to a set of individuals closely resembling each other"--- "nor shall I here discuss the various definitions which have been given of the term species. No one definition has satisfied all naturalists; yet every naturalist knows vaguely what he means when he speaks of a species." -- The Origin of Species, Charles Darwin (1809 - 1882).

"Thus classes (genera and species)-- are merely symbolic or linguistic conveniences not genuine objects as their members are if they are individuals." -- Alfred Whitehead & Bertrand Russell, Principia Mathematica.

This report discusses the topic of species and is outlined as follows: (1) Introduction (2) Historical Background (3) Modern Concepts of Species (4) Mushrooms and the Species Problem (5) Summary.

INTRODUCTION

No one has ever seen Homo sapiens strolling down the avenue; one observes individuals, John and Mary, out for a walk. The species is an idea, a concept of the human mind, which attempts to group individuals in a particular way.

The problems involved in attempting to define what is meant by the term species are immense; consider these four areas of study with respect to the quantity and quality of information available to each:

The Zoologist; man and the higher types of animals can be studied under both natural and controlled conditions. Groups are distinguished by prominent morphological (general shape and form) differences; reproduction is biparential. The number of chromosomes present are known; some things about the genetic make-up have also been discovered.

The Mycologist; very little is known about the genetics of the higher fungi. Taxonomists rely upon variations in the morphology, size, shape and ornamentation of the spores, reactions to various chemicals, geographical distribution and type of habitat, taste, smell, etc. These characteristics are certainly useful in cataloguing types according to their differences. However, these morphological units are then called species.

The Microbiologist; microbes cannot be arranged to show their life history either past or present. Among the bacteria reproduction is typically by assexual division. Identification of species is done by response to various culturing techniques. The bacterial genus Salmonella is divided into some 700-800 species which differ by the combination of their surface antigens. More than one investigator has called the microbial species a macromyth. To the realist the species concept is untenable in microbiology; the practical worker, however, must have some unit to which names can be attached.

The Paleontologist; the subject of fossil species is a controversial topic in paleontology. No direct observation of interbreeding is possible and conclusions must be made through inference. One is forced to work from imprints in rocks, fragments of shells, bones, teeth, etc. Special terms like 'transient species' are used and generally defined as: reproductively isolated groups of individuals living during a single instant of geological time. This definition is based on the hypothesis that if fossil remains from the same strata have slightly different structures, then interbreeding between the two types was not likely. However, significant trends in morphology may not have a genetic basis; the increase in hight among well-nourished humans is a good example.

HISTORICAL BACKGROUND

The purpose of this section is to:

(1) show that the terms genius and species were first used by early thinkers, theorists and logicans and to demonstrate how they handled them; the term species was not commonly used in the biological sense until about the 1670's.

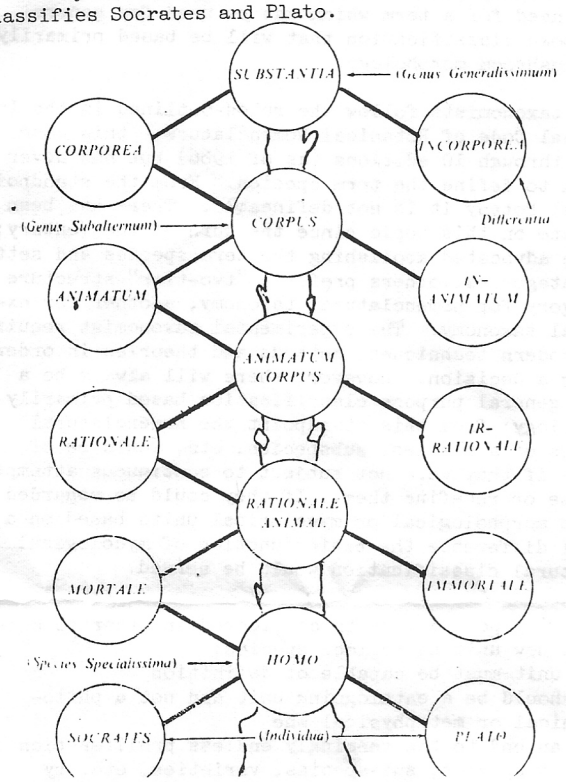
(2) show that some have believed that species, both in the logical and biological sense, actually exist -- rather than being a model invented by the mind for classifying individuals into groups.

Plato (c. 427-347 B.C.). Although his main interest was not in living things he did make contributions of the highest order to the theory of classification. In the Sophistes and the Politicus he showed how by summing up various differences one could arrive at a definition of species; he also showed how the definition of species may vary according to the differences selected along the way. Plato soon asks the question, "What is that which is always real and has no becoming, and that which is always becoming and never real?" As an answer to the first part one may give, the concept-- for it is beyond time and space; the concept that 2 + 2 = 4 does not depend on the mind of man, the century nor any position in the universe. An answer to the second part may be, the object of our senses -- those things we see, feel, etc. The master pattern of Entoloma abortivum may be an eternal idea in the scheme of nature-- the concept, the real; the millions of individuals that fruit and die are the becoming, the object of our senses.

Aristotle (384-322 B.C.). He wrote extensively on biology. In his work, De Partibus he discusses ideas of taxonomic interest; the scala natura was remarkably accurate for that time. The typological species concept has it's roots in Aristotlean essences. (The typological species concept, the basis of present day mycological taxonomy, will be discussed later.) According to Aristotle each species (or form) has an essence, an intrinsic nature that makes it what it is; this essence is universal for the species and is possessed by all individuals that make up the species. The essence may be derived from observing a number of individuals and then abstracting that which is universal in them.

Porphry (c. 232-304 A.D.), Syrian scholar and Neo-Platonist philosopher, living in Rome. He discussed the terms genus and species in his justly famous

work, Isagogue. He asked one question which occupied logicians and thinkers for many centuries. The question was this, "Next as to genera and species, do they actually subsist or are they merely thoughts existing in the understanding alone; if they subsist are they corporeal or incoporeal; are they separate from sensible things or only in and of them? I refuse to answer; these are lofty questions unsuited to an elementary work." A diagram of the relationship among the genus, species and the individual became common in logic texts of the Middle Ages and was called: THE TREE OF PORPHYRY (below); note it starts with the most basic concept, substance and then proceeds like a modern dichotomous mycological key; the branches from the trunk may be considered species. The example classifies Socrates and Plato.



The basic principle on which the medieval world outlook rested was this; universals are real. (Universals are concepts such as genus and species.) What is real is not the individual but humanity; not the knight who tilted in tournaments, wooed his lady or fought in the Holy Land -- only knighthood was real. Those who held this viewpoint were called Realists; the famous Scottish Scholastic, Duns Scotus (c. 1265-1308), was a Realist and called doctor subtilis on account of his power of hair splitting. The Realists were opposed by the Nominalists. One of the founders of Nominalism was William of Occam (c. 1285-1349), doctor invincibilis, who argued that universals are only mental concepts, that they do not exist in things, only in the -uman mind -- universalia sunt nomina, universals are names. Toward the end of the Middle Ages Realism waned. The triumph of Nominalism has been called by some philosophers of history as the most weighty event in modern history -- more important than printing, gunpowder or the Reformation. It turned the medieval world-picture around and ushered in the modern age. Modern science is based on inductive logic, starting with individuals, abstracting the important characteristics and then forming concepts. Realism and deductive logic do the opposite.

In 1689 the English logician John Locke, in An Essay Concerning Human Understanding, offered insights which go straight to the heart of the problem: "genera and species -- depend on such collections of ideas as men have made, and not on the real nature of things" and "The boundaries of species whereby men sort them, are made by men." finally, "Our distinct species are nothing but distinct complex ideas, with distinct names annexed to them."

The term species was used in the modern biological sense by the English naturalist John Ray (1627-1705); he was among the first to lay down guidelines for determining specific differences. His concept of species gradually came to denote the basic unit of biological classification. They were regarded by most biologists as static, created by nature once and for all. It was the task of the taxonomist to recognize them and then group them into higher categories.

Linnaeus (1707-1778), trained as a medical doctor, introduced the concept of binomial nomenclature for plants in Species plantarum in 1753. Before Linnaeus it was customary to give a generic name followed by a description, which could at times be quite lengthy. His system was artificial in that it was not based on evolutionary features; but for the first time it was possible to identify plants quickly and to recognize those which were not previously identified. His methods were based on the timeless essences of Aristotle and Scholastic logic. He was a firm believer in the special creation of plants and had little feeling for the element of time in accounting for the diversity of forms. He thus stands at the end of an era since Science was changing from an exercise in logic to the use of experimental methods. His success lies not in the philosophy but in the practicality.

With the publication in 1859 of Darwin's Origin of Species the species concept entered a new phase. Darwin, trained as a clergyman, was facinated by natural science; his keen interest resulted in a recommendation of appointment as a naturalist aboard a small gunboat, the Beagle. It was a non-paying position that also required the naturalist to pay all his personal expenses; his father agreed to advance the expense money and Darwin became, in the words of Captain Fitzroy "a zealous volunteer in the service of Science." The voyage began in 1831 and lasted for 5 years. While the Beagle circumnavigated the world, Darwin collected data and formed ideas toward confirming the evolutionary development of organisms.

Since the term species was already firmly entrenched it seemed the inevitable choice for the basic unit of evolutionary development. It soon became clear, however, that the species of Pre-Darwinian taxonomists became significantly different when viewed from an evolutionary standpoint. Attempts were made both to redefine the species in modern evolutionary terms, and to set up new categories to supplement or replace it.

MODERN SPECIES CONCEPTS

There are two basic modern concepts:
(1) typological-morphological and
(2) biological.
There are other concepts but they are usually some variation of these two.

The typological-morphological species concept; the species may be loosely defined as a group of individuals essentially indistinguishable from some specimen selected as type, the standard of reference. Since morphological properties are the easiest or most convenient to describe, they are commonly used for the species descriptions. This is the concept generally used to classify the higher fungi and the procedure is outlined in the International Code of

Botanical Nomenclature. The logical basis goes back to the essences of Aristotle-- it is the task of the taxonomists to locate the essence and describe the universal properties associated with it. The advantages of this concept are:

(a) descriptions and types provide reference points for standardizing information about groups.
(b) it is a useful first approximation upon which other studies and refinements can be built
(c) most of the current names of species were established by typological procedures
(d) most individuals are recognized from a morphological standpoint.

The disadvantages are:

(a) it assumes that neither the essences nor the species change with time; hence it is static
(b) the type is subject to revision when newer methods or information become available--small deviations from type can result in a proliferation of new species; this is the current problem in the higher fungi
(c) often there are no visible morphological differences but which can be shown by other means to be distinctive.

The biological species concept; the inability to interbreed is the key feature which separates groups into species. A working definition might be: species are groups of interbreeding natural populations that are reproductively isolated from other such groups. This is not a new idea; John Ray discussed it in the 1670's, Lamarck in 1803 and DeCandolle (1778-1841) had a reproductive basis for species with even an evolutionary statement incorporated in it. (Psathyrella candolleana is named in his honor.) The major disadvantages to this definition are obvious

(a) it does not apply to organisms which reproduce asexually, such as is typical in bacteria
(b) it is usually static, not accounting for changes through time.

The problems associated with these two concepts point out the difficulties establishing a universal definition for species. Such a concept would have to satisfy the following conditions:

(1) be dynamic
(2) allow organisms to be sorted into discrete well-defined groups
(3) account for morphological, ecological, physiological and genetic similarities and differences within a population
(4) apply to all types of reproduction
(5) account for evolution.

There are other modern concepts which are variations of the above; a third concept combines these two within an evolutionary framework. All have advantages and disadvantages. From time to time one hears of: The Competent Taxonomist Concept; this idea is some variation of one definition of a species: A community of organisms whose distinctive morphological characteristics are in the opinion of a competent taxonomist sufficiently definite to entitle it or them to specific rank.

Many who reject all other definitions accept this one as a last resort. There are again, however, very serious problems. Several studies have been made and two examples are cited at random. In 1906 the number of described German species of hawkweed (Hieracium) ranged from 300 for one author, through 106 for another and 52 for a third to less than 20 for a fourth. In a study reported in 1951 three competent taxonomists (two of whom were past presidents of the American Society of Plant Taxonomists) classified the same material, same material, raspberries and blackberries, genus Rubus, native to North America. The results were 494, 205 and 24. The splitter had over 20 times as many species as the lumper which means that in a population where one of them recognized only one species the other, on the average recognized 20.

MUSHROOMS AND THE SPECIES PROBLEM

From the practical standpoint there are two problems facing the mycologist

(1) the need to understand what is meant and included in the term species
(2) the need for a term which can be used for general purpose classification that will be based primarily on mushroom morphology.

Mushroom taxonomists follow the rules outlined in the International Code of Botanical Nomenclature: this code has gone through 10 editions (as of 1966) but has never attempted to define the term species. From the standpoint of general botany it is not defineable. There has been much debate on this topic since the turn of the century; some have advocated abolishing the term species and setting up new categories; others prefer a "two-tier" structure -- one category for nomenclatural taxonomy, another for experimental taxonomy. The experimental taxonomist requires all the modern techniques, methods and theories in order to render a decision. However, there will always be a need for general purpose classification based primarily on morphology; from this standpoint the nomenclatural categories of a species, subspecies, etc. would be of advantage if they were not subject to continuous attempts to up-date or redefine them. If they could be regarded mainly as morphological or mycological units based on a degree of difference the basic function of mycological nomenclatural classification would be served.

The following points must be considered in order to substitute a new unit to replace species:

(1) the unit must be capable of definition
(2) it should be a cataloguing unit and not a philosophical or metaphysical one
(3) put an end to the seemingly endless proliferation of new species, sub-species, varieties, etc. by handling new discoveries in such a manner that is not disruptive to the basic category
(4) recognize that very little is known about classifying the higher fungi, at present, except for morphological differences
(5) retain all the generic and specific names in use since Linnaeus
(6) give credit where credit is due -- past, present and future.

Around the turn of the century a concept was introduced and named species collectivae. It was further developed into what is now called the aggregate concept. An aggregate is made up of morphologically related species that are difficult to distinguish. The concept is best explained by an example, the Russula foetens comples which is a population that includes several look-alikes. R. foetens has a fetid smell and the spores lack wings; R. subfoetens is quite close and is separated out with KOH; R. laurocerasi has a pleasant odor and the spores have wings; R. fragantissima and R. fragrans are close to the preceeding and differ in the hight of the wings. R. illota is also close to R. laurocerasi but has has spotted gill edges. There are several ways to organize the above, depending on where to place emphasis and how to to define the importance of parameters; for example, how important is smell in separating two populations like R. foetens and R. laurocerasi, which are otherwise rather similar. One of several ways would be to name R. foetens the aggrigate since it is the oldest recognized name along and then listing the others as segregates. it could then be catalogued, along with other Russula aggregates, as follows:

Russula agg. foetens Fries
R. seg. subfoetens W.G. Smith
R. seg. laurocerasi Melzer
R. seg. fragans Romagnesi
R. seg. illota Romagnesi

At present no one can rigidly prove that any of the above Russulas are species. However, the aggregate concept catalogues them only as relatives belonging to the same morphological population, retains the current nomenclature, places the species controversy in abeyance and allows future segregates to be included without disrupting the overall concept.

SUMMARY

1. The terms genus and species were first used by early thinkers and theorists; somewhat later logicians also used the term to denote concepts.

2. Biological species do not exist in nature; the concept is useful in classifying individuals which appear to have similar characteristics.

3. Most biologists before Darwin believed in a special-creation concept-- species were created once and for all, and it was the task of the taxonomists to describe and classify them.

4. The Darwinian doctrine of evolutionary development completely upset this view and the concept of species entered into a vague, gray area which could only be viewed, as Saint Paul once said in another context, "through a glass, darkly."

5. Many proposals have been made in the last century to either drop the term species entirely or redefine the entire idea. For various reasons these proposals have not prevailed.

6. The International Code of Botanical Nomenclature does not define the term species; this is most singular, considering the importance of species.

7. Most present day botanists rely on an inexact, almost intuitive, idea of species.

8. The species is an idealized concept and the different groups of biological populations only approximate the ideal.

9. There do not exist in nature groups of individuals which must be classified in only one incontestable way, which is then called the species.

10. The biological species problem has not been solved; however, in the process of pursuing a Holy Grail taxonomists have learned a huge amount about morphology, some physiology, a lot about ecology and a number of other worthwhile things.

BIBLIOGRAPHY

H. Clemencon, 1978, The Species Concept in Hymenomycetes
E. Mayr, 1957, The Species Problem
C. Slobodchikoff, 1976, Concepts of Species

MEETING

The next executive board meeting will be held Wednesday, August 6th at SCEEC, downstairs at 8:00 p.m. Topics to be discussed will be the Fungus Fair plans and NJMA's commitment to handle the collections and identification at the Northeast Foray in Vermont. This meeting is open to any members wishing to attend. Those who would like their opinions heard about the way the club is being run, or have any suggestions for the future should attend, since there is no regular meeting scheduled until November. Voice your opinions. Anyone intending to help with identification at the Northeast or participate in the fair should attend.

Things you might never know if you didn't join a mushroom club.....

The mycellium of certain fungi growing in organic matter in the soil can suddenly turn carnivorous and actively trap insects. That is, for some reason, certain species of these fungi decide to form circular loops of cells. When an unsuspecting nemotode comes by and enters the loop, for some reason the mycellium reacts, and in 1/10 of a second the cells of the loop swell to more than three times their size, capturing the nemotode. A toxin is apparently injected and within an hour or two the nemotode dies, and is ingested by the fungus.

New Jersey Mycological Assn.
c/o Jim Richards, President

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