



TRANSCRIPT

Episode 102
Missouri Botanical Garden Library
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(ANIMUSIC.COM THEME SONG PLAYING)

Grycz>> IF YOUR AIM IN LIFE IS TO FIND, NAME AND IDENTIFY EVERY PLANT IN THE WORLD, YOUR PATH WILL DEFINITELY TAKE YOU TO THE MISSOURI BOTANICAL GARDEN IN ST. LOUIS. "THE LIBRARY AT THE MISSOURI BOTANICAL GARDEN: MAKING THE WORLD A BETTER PLACE, ONE PLANT AT A TIME", COMING UP ON "GREAT LIBRARIES OF THE WORLD".

(MUSIC PLAYING)

Grycz>> ENGLISHMAN HENRY SHAW WAS JUST 19 YEARS OLD WHEN HE ARRIVED IN ST. LOUIS. IT WAS A SMALL FRENCH VILLAGE AT THE TIME, BUT WITH THE INVENTION OF THE PADDLE-WHEELED SCHOONER AND THE RECENT LOUISIANA PURCHASE, IT WAS A BOOM TOWN. SHAW SAW AN OPPORTUNITY AND STARTED A HARDWARE STORE SELLING GOODS TO THE PEOPLE OF ST. LOUIS, NEW IMMIGRANTS, AND PIONEERS ON THEIR WAY TO THE WEST. IN 40 YEARS, HE WAS A WEALTHY MAN. HE DECIDED TO RETIRE AND PURSUE HIS LOVE OF BOTANY. IN 1851, SHAW RETURNED TO ST. LOUIS AND BUILT HIMSELF AN ESTATE WITH A MAGNIFICENT GARDEN. HIS GARDEN BECAME THIS GARDEN: THE MISSOURI BOTANICAL GARDEN. AND THIS GARDEN HAS A SECRET GARDEN: ONE OF THE FINEST BOTANICAL LIBRARIES IN ALL THE WORLD. IT HAS 160,000 VOLUMES; 7,000 RARE BOOKS; AND AN HERBARIUM THAT HAS FIVE MILLION DRIED SPECIMENS OF PLANTS THAT SCIENTISTS FROM ALL OVER THE WORLD COME TO VISIT AND RESEARCH.

Holland>> ALL ST. LOUIS-ANS KNOW ABOUT THE GARDEN ITSELF AND USE IT A LOT. BUT FAR FEWER KNOW ABOUT THE RESEARCH COMPONENT, OR EDUCATION COMPONENTS, BOTH OF WHICH GIVES US MORE NOTORIETY, GLOBALLY.

Zapata>> WE HAVE ACCESS TO THE GREAT COLLECTIONS IN THE BOTANICAL GARDEN. AND THE COLLECTIONS ARE UNIQUE. AND WE HAVE A LOT OF CURATORS. THE LIBRARY, HERE, IT'S JUST WONDERFUL. I MEAN, IF YOU'RE LOOKING FOR SOMETHING IN "PLANTS" AND YOU DON'T FIND IT HERE, IT'S VERY UNLIKELY YOU'RE GONNA FIND IT SOMEWHERE ELSE.

Holland>> WE'RE QUITE A SPECIALIZED LIBRARY IN THAT OUR... WE HAVE A LOT OF MISSIONS, BUT OUR REAL CORE-CORE MISSION IS TO SUPPORT THE RESEARCH THAT GOES ON HERE, WHICH IS PRINCIPALLY "PLANT NAMING", "PLANT CLASSIFICATION", AND "PLANT TAXONOMY". WITHIN THOSE, WE TRY TO BE AS COMPREHENSIVE AS WE CAN AS FAR AS COLLECTING. MEANING WE BUY ANYTHING PRINTED, ANYWHERE, IN ANY LANGUAGE, IN ANY TIME, WITHIN "PLANT SYSTEMATICS", "FLORISTICS" AND "TAXONOMY".

Yatskievych>> THIS IS THE HEART OF THE HERBARIUM. THIS IS WHERE WE STORE THE SIX-MILLION-PLUS SPECIMENS THAT ARE THE HEART OF OUR MUSEUM OPERATION. THIS AISLE, HERE, SHOWS SOME OF THESE SPECIMENS. THEY'RE ORGANIZED VERY, VERY CAREFULLY BY "PLANT FAMILY" AND THEN BY "GENUS" AND "SPECIES" WITHIN THE "FAMILIES". AND, ALL THESE PRETTY COLORS, HERE, DENOTE DIFFERENT PARTS OF THE WORLD; DIFFERENT REGIONS WHERE THESE PLANTS GROW WITHIN A GIVEN GENUS. SO THAT, FOR EXAMPLE, THE ASIAN ONES ARE COLOR-CODED WITH PURPLE ON THE FOLDERS, AND THE EUROPEANS ARE CODED WITH JUST PLAIN FOLDERS AND SO ON AND SO FORTH. THIS MINIMIZES THE WEAR-AND-TEAR ON THE SPECIMENS AND ALSO MOST OF OUR STAFF AND INDIVIDUALS ARE INTERESTED IN A PARTICULAR REGION OF THE WORLD.

Ulloa>> FOR ME, DIRECTLY AS A RESEARCHER, SUSTAINABILITY OF THE WORLD WE LIVE IN GOES DIRECTLY BACK TO MY ROOTS IN ECUADOR. THE GARDEN HAS VERY STRONG PROGRAMS IN SEVERAL COUNTRIES IN THE WORLD, ECUADOR BEING ONE OF THEM. WE WORK WITH OUR COLLEAGUES--COLLABORATE WITH THEM--TO PUT TOGETHER IDEAS, ACTION, AND RESEARCH PROJECTS TO MAKE A BETTER WORLD, MORE SUSTAINABLE. NOT TALKING, BUT DOING THINGS.

Holland>> IT WOULD SURPRISE A LOT OF PEOPLE THAT WE DON'T HAVE A LIST OF THE PLANTS GROWING ON THE EARTH.

Grycz>> KARL LINNAEUS, A PHYSICIAN AND HOBBYIST GARDENER, DEvised A SYSTEM FOR CLASSIFYING "ALL LIFE ON EARTH". HE DIVIDED PLANTS--AND EVENTUALLY ALL LIVING THINGS--INTO CATEGORIES BASED ON PHYSICAL OBSERVATION: LIFE-> DOMAIN-> KINGDOM-> PHYLUM-> CLASS-> ORDER-> FAMILY-> GENUS-> SPECIES. THE LINNAEAN SYSTEM WAS DESCRIBED IN A BOOK CALLED "SPECIES PLANTARUM" WHICH WAS PUBLISHED, FIRST, IN 1753. BECAUSE OF ITS SIMPLICITY AND UNIVERSALITY THE LINNAEAN-TAXONOMY IS STILL IN USE TODAY.

Holland>> [THERE WERE] AROUND 5500-5600 PLANT SPECIES HE [LINNAEUS] DESCRIBED IN THOSE TWO BOOKS. THAT WAS HIS ATTEMPT TO DESCRIBE ALL OF THE KNOWN PLANTS IN THE WORLD. IT WAS AMBITIOUS, CERTAINLY, AT THE TIME. BUT, RIGHT NOW OUR ESTIMATES ARE THAT ABOUT 250,000 PLANTS

HAVE BEEN DESCRIBED, BEST WE CAN TELL; THINKING THAT THERE MAY BE AS MANY AS 350,000 OR 400,000 STILL TO DO! BUT YOU CAN'T KNOW WHAT YOU DON'T KNOW. WE'RE STILL WORKING OFF OF LINNAEUS' BASIC NAMING CONSTRUCTION. HE, MORE-OR-LESS, INVENTED (OR CERTAINLY POPULARIZED) THE USE OF THE "GENUS/SPECIES" PLANT TWO-NAME, THE "PLANT BI-NOMIAL SYSTEM" IN "SPECIES PLANTARUM;" AND THE ROUGH CLASSIFICATION STRUCTURE. AND WE'RE STILL USING THAT STRUCTURE.

Yatskievych>> SOME OF OUR OLDEST COLLECTIONS, SUCH AS THIS BLACKBERRY... THIS PARTICULAR SPECIMEN WAS COLLECTED IN THE 1740'S. IT ACTUALLY PRE-DATES THE PUBLICATION OF LINNAEUS' "SPECIES PLANTARUM". SO IT DOESN'T HAVE A "BI-NOMIAL". THAT IS, IT'S NOT IDENTIFIED WITH THE "GENUS/SPECIES" EPITHET. INSTEAD, THERE'S A WHOLE PARAGRAPH DESCRIBING THAT OR ESSENTIALLY NAMING IT: "RUBIS FOLIIS CERNOTUS, ET..." AND IT GOES ON AND ON AND ON. THIS IS HOW BOTANISTS LEARNED PLANT NAMES BEFORE LINNAEUS SORT OF STANDARDIZED THINGS WITH "THE BI-NOMIAL SYSTEM".

Grycz>> AND CAME UP WITH A SHORT-CUT, SO THAT BOTANIST COULD, IN AN ABBREVIATED FASHION, TALK ABOUT THE SAME PLANTS.

Yatskievych>> LINNAEUS ONLY KNEW A FEW THOUSAND SPECIES. BUT, NOW, WE'RE UP TO 350,000. IMAGINE TRYING TO REMEMBER A WHOLE BOOK ABOUT EACH ONE!

Yatskievych>> WE HAVE SOME OTHER INTERESTING COLLECTIONS, HERE, FROM THE HISTORICAL PORTION OF OUR HERBARIUM. THIS SPECIMEN, HERE, IS A FERN THAT WAS COLLECTED BY CHARLES DARWIN ON THE VOYAGE OF THE "BEAGLE."

Grycz>> HA!

Yatskievych>> AND THIS IS DARWIN'S HAND, HERE; HIS ORIGINAL LABEL. IT SAYS IT WAS COLLECTED NEAR "CERRO TRES MONTES" IN DECEMBER 1834. AND THAT'S CHARLES DARWIN. THE EARLY EXPLORERS DIDN'T KNOW THAT WE WERE GOING TO WANT TO PIN-POINT WHERE THEY GOT THESE SPECIMENS, SO THEY'RE A LITTLE SHY ON LABEL DATA. WE COULDN'T USE THIS ONE FOR "GIS" OR ANY OTHER PURPOSE, ELECTRONICALLY, BECAUSE WE CAN'T REALLY MAP IT VERY WELL. HOWEVER, FORTUNATELY FOR US, THEY ALSO WROTE JOURNALS. SO, FOR EXAMPLE, THIS IS DARWIN'S "VOYAGE OF THE BEAGLE," HIS JOURNAL. ONE CAN ACTUALLY GO TO THE PLACE WHERE "TRES MONTES" IS NAMED. AND HERE ON DECEMBER 30, 1834 HE TALKS ABOUT HOW THEY WERE ANCHORED THERE; AND WHERE THEY WENT; AND THE ELEVATION, THE GEOLOGY... AND IT GOES ON FOR A COUPLE OF PAGES.

Grycz>> SO, HE WAS VERY SPECIFIC ABOUT TRYING TO DOCUMENT EVERYTHING THAT COULD HAVE HAPPENED THAT COULD BE OF POTENTIAL INTEREST.

Yatskievych>> YES, TO THE EXTENT THAT HE COULD OBSERVE IT.

Grycz>> THIS IS LABELED AS "ITEM NUMBER 712". THERE WERE PROBABLY THOUSANDS OF THINGS HE BROUGHT BACK FROM THE "BEAGLE."

Yatskievych>> I'M NOT SURE WHAT THE ENTIRE EXTENT IS. WE OBVIOUSLY ARE NOT A MAJOR REPOSITORY FOR DARWIN'S HERBARIUM. BUT WE WERE ABLE TO GET SOME OF THESE. THEY PROVIDE A HISTORICAL DEPTH TO OUR COLLECTIONS THAT'S MISSING FROM MANY OTHER MUSEUMS, BECAUSE BOTANY IS SUCH A YOUNG SCIENCE IN THIS COUNTRY RELATIVE TO EUROPE. THIS WAS COLLECTED BY WISLIZENUS ON ONE OF THE U.S./MEXICAN BOUNDARY SURVEYS.

THIS WAS COLLECTED BY FREMONT ON HIS EXPLORATION OF THE ROCKY MOUNTAINS.

THIS IS AN INTERESTING ONE. EDGAR MEARNS WAS A BOTANIST WHO ACCOMPANIED TEDDY ROOSEVELT ON SOME OF HIS BIG GAME EXPEDITIONS TO AFRICA.

Grycz>> HAH!

Yatskievych>> NOT ALL OF THE PLANTS IN THE HERBARIUM ARE NECESSARILY NICE AND NEATLY PRESSED AND FLATTENED BEFORE THEY'RE DRIED. IF YOU'LL BRING ME THAT BAG, WE CAN SHOW A VARIATION ON A THEME.

Grycz>> I WAS WONDERING ABOUT "NUTS", BUT THIS IS A LITTLE EXAGGERATED.

Yatskievych>> THIS IS FROM THE "MONKEY POD TREE". OBVIOUSLY, IT WOULDN'T PRESS VERY WELL. SO WE HAVE SOME OF THESE THREE-DIMENSIONAL OBJECTS IN SEPARATE BAGS. WE ALSO HAVE AN HERBARIUM OF "BRYOPHYTES" (THAT IS, "MOSESSES" AND "LIVERWORTS"). THESE PLANTS ARE KEPT IN SMALL ENVELOPES, BECAUSE THAT'S THE WAY THAT THEY'RE BEST STUDIED.

Grycz>> PEOPLE SAY THAT HERE AT MISSOURI BOTANICAL GARDEN YOU HAVE ACCESS TO THIS BUILDING 24 HOURS A DAY, SEVEN DAYS A WEEK! DOES THAT MAKE A DIFFERENCE? DOES ANYBODY ACTUALLY WORK AT TWO O'CLOCK IN THE MORNING?

Zapata>> I DO, SOMETIMES; HA, HA, HA. BUT IT'S TRUE. IT'S SOMETHING THAT'S REALLY, REALLY AMAZING. WHEN I CAME FOR THE FIRST TIME--AS A STUDENT WORKING WITH PLANTS--I GOT AN OFFICE HERE: AN OFFICE SPACE.

I GOT MY BADGE AND, YEAH, I CAN COME HERE, WORK AS LATE AS I WANT. I HAVE ACCESS TO EVERYTHING. THE LIBRARY'S OPEN. THE HERBARIUM'S OPEN. IT'S UNIQUE TO HAVE OPEN-ACCESS TO ALL THE BOOKS, ALL THE JOURNALS, ALL THE PLANTS; AND [IT IS] REALLY, REALLY USEFUL. YEAH, IF YOU SOMETIMES COME UP HERE, LATE AT NIGHT, YOU MIGHT FIND SOME STUDENTS, SOME VISITORS, SOME PEOPLE DOING SOME WORK HERE. SO IT'S REALLY INTERESTING TO SEE PEOPLE THAT LATE AT NIGHT. BUT THERE ARE SOME PEOPLE THAT WORK THAT LATE.

Grycz>> YOUR JOB IS TO DESCRIBE AND UNDERSTAND A SPECIMEN--OR A GROUP OF RELATED PLANTS--AS THOROUGHLY AS YOU POSSIBLY CAN.

Zapata>> YEAH.

Grycz>> AND TO DOCUMENT THAT.

Zapata>> YEAH. THAT'S BASICALLY A VERY BROAD DEFINITION OF BASIC SCIENCE IN BOTANY OR PLANT SYSTEMATICS.

Grycz>> AND EVERY DAY THERE'S A POTENTIAL FOR A DISCOVERY.

Zapata>> OH, YEAH! THAT'S FOR SURE! EVERY TIME YOU GO TO A NEW PLACE ON EARTH... OR YOU START STUDYING SPECIMENS MORE CAREFULLY... OR YOU FIND A NEW VARIANT IN ONE GENE OR SOMETHING... THERE'S POTENTIAL FOR FINDING NEW STUFF. I MEAN, THE HARD PART IS TRYING TO UNDERSTAND WHAT IS GOING ON, AND TRYING TO ACCUMULATE EVIDENCE TO SUPPORT YOUR HYPOTHESIS. SO, IT'S A VERY INTERESTING JOB, I GUESS. HA, HA.

Grycz>> SO, IT DOESN'T SOUND LIKE YOU GET BORED DOING YOUR JOB.

Zapata>> OH, NO. I REALLY ENJOY WHAT I DO. HA, HA, HA. I DON'T GET BORED AT ALL.

Grycz>> TELL US A LITTLE BIT ABOUT YOUR FIELD WORK.

Zapata>> YEAH. I HAVE BEEN DOING FIELD WORK FOR MY DISSERTATION, SPECIFICALLY. I HAVE BEEN DOING FIELD WORK IN COLUMBIA, IN PERU, IN BOLIVIA, CHILE, IN ARGENTINA AND BRAZIL. FIELD WORK IS SOMETIMES VERY DIFFICULT. LOGISTICS: IT'S SOMETIMES HARD TO GET TO SOME PLACES. IT'S DIFFICULT. THERE ARE NO ROADS. YOU HAVE TO CAMP, ETC. BUT SOMETIMES IT'S JUST GREAT FUN. I MEAN, AS SOON AS YOU'RE OUT IN THE FIELD AND YOU START WORKING, LOOKING FOR PLANTS, YOU FIND DIFFERENT THINGS. IT'S REALLY WONDERFUL SOMETIMES. I MEAN, USUALLY... AND ALWAYS... IT'S VERY, VERY GREAT.

Ulloa>> SOMETIMES YOU FIND A PLANT THAT IS NOT IN BLOOM. BUT YOU SUSPECT IT MIGHT BE A NEW SPECIES, FOR EXAMPLE, TO SCIENCE. SO, YOU MAY BRING THE SEEDS AND GROW IT HERE. AND THEN, AFTER SOME YEARS, IT WILL FINALLY BLOOM. AND THEN YOU CAN SAY "YES, IT IS A NEW SPECIES." AND YOU CAN FORMALLY DESCRIBE IT AS A NEW SPECIES.

Grycz>> YOU'RE ALSO INVOLVED IN PUBLIC OUTREACH THROUGH ADULT PROGRAMS. CAN YOU TELL US A LITTLE ABOUT WHO INITIATED THAT, AND HOW YOU GOT INVOLVED IN TEACHING ADULTS IN ST. LOUIS ABOUT PLANTS?

Ulloa>> WE HAVE A VERY BIG OPPORTUNITY TO TELL THE PEOPLE WHAT WE DO, AND WHY IT'S IMPORTANT WHAT WE DO. SO I LIKE TO DO THAT. I'M GOING TO GIVE A LECTURE IN THE ADULT EDUCATION PROGRAM THAT IS ORGANIZED BY GLENN KOPP HERE AT THE GARDEN.

Kopp>> I OVERSEE THE ADULT EDUCATION PROGRAMS. WE HAVE A VARIETY OF PROGRAMS FOR MEMBERS, AND THE GENERAL PUBLIC, TO ATTEND: LEARNING ABOUT PLANTS, ABOUT GARDENING, CRAFTS, ART. WE DO A WHOLE RANGE OF THINGS AS FAR AS CONTINUING EDUCATION PROGRAMS FOR PEOPLE TO ATTEND. LAST YEAR WE HAD A GENTLEMAN SPEAKING ON "DROUGHT-TOLERANT TREES". AND SOME OF OUR EDUCATION STAFF WORKS WITH AREA SCHOOLS; AND GOES (AND DOES) TEACHING FOR THEM; AND PROVIDES, YOU KNOW, SPECIAL CLASSES FOR THEM. EVERY YEAR THERE IS THE "SYSTEMATICS SYMPOSIUM" WHERE BOTANISTS COME FROM AROUND THE WORLD. A WEEK OF PROGRAMS, LECTURES AND SO FORTH, ON, MAINLY, "TAXONOMY". BECAUSE THAT'S WHAT, MAINLY, THE GARDEN IS INVOLVED IN.

Grycz>> THIS IS HENRY SHAW HIMSELF. THESE ARE HIS GARDENS. THERE IS HIS SUMMER RESIDENCE. YOU CAN IMAGINE HIM, SITTING IN HIS LIBRARY ON A WARM SUMMER'S DAY, PULLING ONE VOLUME OFF THE SHELF AFTER ANOTHER. A BEAUTIFUL ILLUSTRATED BOTANICAL FROM 1570, 1780... HE WAS VERY MUCH INVOLVED WITH UNDERSTANDING THE PLANTS THAT HE GREW IN HIS GARDEN.

Grycz>> [THE GARDEN] WAS FOUNDED BY HENRY SHAW IN 1859. DID HE HAVE AN IDEA WHAT THIS WOULD BECOME 150 YEARS LATER?

Holland>> I THINK HE DID. HE TRIED HIS BEST TO POSITION, PREPARE THE GARDEN ITSELF; PREPARE THE FINANCES TO CARRY ON THROUGH TIME AND BE ON PAR WITH THE OTHER GREAT BOTANICAL GARDENS THAT HE KNEW OF AND BECAME FAMILIAR WITH IN EUROPE. HE PARTICULARLY SOUGHT ADVICE FROM WILLIAM HOOKER AT KEW GARDENS (IN KENSINGTON, OUTSIDE OF LONDON), ABOUT HOW TO REALLY CONSTRUCT A WORLD-CLASS BOTANICAL GARDEN.

Bussman>> WHAT WE DO IS TO WORK ON EVERYTHING YOU CAN DO WITH PLANTS. WE DO SEE THAT PLANTS ARE EVERYWHERE IN OUR LIVES. SO IF YOU

GET FRESH VEGETABLES, TROPICAL FRUITS--WHATEVER YOU WANT--DO YOUR OWN ORGANIC GARDENING OR WHATNOT, YOU'RE WORKING WITH PLANTS. IF YOU TRY TO CULTIVATE OLD HEIRLOOM VARIETIES SOMEWHERE ON YOUR FARM OR SOMEONE WHO WORKS WITH PLANTS. SO THEY'RE EVERYWHERE IN DAILY LIFE. AND, OF COURSE, NOWADAYS WE TALK ABOUT "BIO-FUELS". AND YOU ALSO HAVE PLANTS THAT CONTRIBUTE TO A BETTER ENVIRONMENT... OR NOT. THAT IS SOMETHING WE ARE WORKING ON, TOO. SO, SAY, IF YOU WANT TO BUY A NEW PIECE OF ROPE THAT INCLUDES COTTON, OR IF YOU WANT TO DYE YOUR OWN FABRICS, OR DRINK WINE, OR YOU MIGHT GET AN HERBAL SUPPLEMENT. THOSE ARE ALL [THINGS] THAT WE'RE INTERESTED IN.

WE ALSO DO SERIOUS THINGS LIKE STANDARDIZATION OF HERBAL MEDICINES JUST TO MAKE SURE THE POUCH YOU BUY, CONTAINS THE PLANT YOU WANT TO TAKE, AND NOT SOMETHING POISONOUS OR USELESS.

Ulloa>> THE FRONDS OF THESE PLANTS ARE USED TO MAKE "PANAMA HATS". ALTHOUGH THE NAME IS CALLED "PANAMA HATS," IT'S NOT A TRUE HAT FROM PANAMA. THE STORY--OR ONE OF THE STORIES--IS THAT DURING THE CALIFORNIA GOLD RUSH WORKERS USED THOSE HATS THAT WERE BROUGHT FROM ECUADOR WHERE THEY ARE MADE, THROUGH THE PANAMA CONNECTION: THROUGH THE PANAMA CANAL.

Grycz>> AH-HA.

Ulloa>> SO, FROM THERE, THE NAME TOOK OFF AS "PANAMA HATS". BUT THE BEST AND FINEST PANAMA HATS ARE MADE IN ECUADOR.

Grycz>> SO, THESE SHOULD REALLY BE "ECUADORIAN HATS".

Ulloa>> YES. BUT EVEN IN ECUADOR THEY ARE CALLED "SOMBRERO DE PANAMA": "PANAMA HAT".

Yatskievych>> THE GARDEN'S DATABASE SYSTEM, "TROPICOS"--WHICH IS AVAILABLE AT THE GARDEN WEB SITE--IS SAID TO BE THE LARGEST DATABASE OF PLANT INFORMATION, ANYWHERE. AND IT'S NOT JUST ON THE TROPICS. IT'S WORLDWIDE. THE "TROPICOS" DATABASE IS A NUTS-AND-BOLTS AFFAIR. WE HAVE INFORMATION ON THE PLANT NAMES. WE HAVE INFORMATION ON THE INDIVIDUAL SPECIMENS THAT ARE IN OUR MUSEUM, OUR HERBARIUM. OF COURSE, OUR MUSEUM IS 150 YEARS OLD IN 2009, SO WE'RE STILL PLAYING CATCH-UP WITH THE HISTORICAL INFORMATION. BUT WE HAVE A LITTLE OVER HALF OF OUR MUSEUM ONLINE, IN TERMS OF THE SPECIMENS. AND THEN THESE HAVE TO BE CORRELATED WITH THE BIBLIOGRAPHIC INFORMATION AND THE OTHER DESCRIPTIVE INFORMATION THAT'S HOUSED IN THE LIBRARY IN THE FORM OF BOOKS, JOURNALS AND OTHER RESOURCES OF THAT SORT.

Freeland>> THE BOOKS THAT ARE IN OUR COLLECTION ARE OFTEN NOT WIDELY HELD BY MANY LIBRARIES AROUND THE WORLD. YET THEY'RE CORE MATERIALS THAT SCIENTISTS NEED TO ACCESS TO DO THEIR TAXONOMIC WORK. SO, WE PUT THESE ONLINE SO EVERYBODY CAN HAVE ACCESS TO THE CONTENT. ALSO SO THEY CAN USE NEW TECHNOLOGY TO EXTRACT INFORMATION FROM THE BOOKS AND DO "SECONDARY POST-PROCESSING" AND "DATA MINING" OUT OF THAT CONTENT: BASICALLY, LEARN NEW THINGS, MAKE NEW ASSOCIATIONS WITHIN THE CONTENT THAT IS HELD IN THESE BOOKS. SO, WE TAKE THOSE PAGE IMAGES AND WE RUN THEM THROUGH "OPTICAL CHARACTER RECOGNITION" SOFTWARE, WHICH EXTRACTS THE TEXT OF THE PAGES... (TRIES TO EXTRACT THE TEXT FROM THE PAGES. OF COURSE, SOME OF THE FONTS POSE PROBLEMS.) WHAT WE CAN DO, THEN, IS WE CAN GO THROUGH OUR ENTIRE COLLECTION AND FIND EVERY OCCURRENCE OF A PARTICULAR WORD LIKE "ZIA MAIZE", WHICH IS THE SCIENTIFIC NAME FOR "CORN". WE'RE DOING IT IN COLLABORATION WITH PARTNERS AT THE MARINE BIOLOGICAL LABORATORY IN WOODS HOLE, MASSACHUSETTS.

Holland>> THIS IS THE FIRST TIME I CAN THINK OF, THAT "THE SMITHSONIAN," "HARVARD," "MISSOURI BOTANICAL GARDEN," "NEW YORK BOTANICAL GARDENS," "THE AMERICAN MUSEUM OF NATURAL HISTORY," "NATURAL HISTORY MUSEUM IN LONDON", "KEW GARDENS IN LONDON" HAVE ALL WORKED TOGETHER ON ONE SINGLE PROJECT. WE WORK TOGETHER--IN A LARGER PICTURE--BUT NEVER ON A SINGLE FUNDABLE PROJECT.

Grycz>> ONE SPECIES OF PASSION FLOWER IS "PASSIFLORA ALATA".

Grycz>> TELL ME A LITTLE ABOUT THE PASSION FLOWER.

Ulloa>> DO YOU KNOW THEY ARE CALLED "PASSION FLOWERS?"

Grycz>> I DO NOT.

Ulloa>> WELL, PASSION FLOWERS ARE CALLED LIKE THAT BECAUSE, IN ANCIENT TIMES, PEOPLE ASSOCIATED THE FLOWER WITH THE PASSION OF CHRIST, WITH A CROWN OF THORNS.

Grycz>> AH-HA.

Ulloa>> THE COLOR OF THE PETALS, WHICH ARE REDDISH, WITH THE BLOOD. AND IN THE CENTER THERE ARE LIKE THREE LITTLE NAILS. THEY ARE THE FEMALE REPRODUCTIVE ORGANS OF THE FLOWER, BUT THEY WERE ASSOCIATED WITH THE NAILS THAT CHRIST HAD ON THE CROSS.

Grycz>> AMAZING, AMAZING.

Ulloa>> YES, SO, MANY, MANY FLOWERS IN THESE GROUPS PRESENT THEMSELVES LIKE THESE. SO THEY WERE ASSOCIATED WITH THE CRUCIFIXION AND THE NAME CAME FROM THAT.

Grycz>> THIS IS ALSO A PLANT THAT WAS REFERRED TO IN THE LITERATURE, IN SOME OF THE BOOKS OF THE LIBRARY, FROM VERY EARLY-ON.

Ulloa>> YES, YES. THIS PLANT WAS ORIGINALLY DESCRIBED BY CURTIS FROM A PLANT CULTIVATED IN ENGLAND. MANY PLANTS FROM THE TROPICAL AMERICAS WERE TAKEN TO EUROPE. FROM THERE, ONCE THEY BLOOMED, THEY WERE DESCRIBED OFFICIALLY BY A BOTANIST. AND SO, IN OUR LIBRARY, WE HAVE A VERY NICE ORIGINAL DESCRIPTION OF THIS FLOWER, WITH A HAND-PAINTED ILLUSTRATIONS. IMMEDIATELY YOU WILL RECOGNIZE THE LIVE THING FROM WHAT IS ON PAPER.

Ulloa>> THIS MORNING, WE SAW THIS PASSION FLOWER IN THE GREENHOUSE, HERE, IN THE GARDEN. BOTANISTS, WE ALWAYS, IN OUR WORK-- WE ALWAYS HAVE TO GO BACK TO THE ORIGINAL DESCRIPTION OF THE PLANT. IN THIS CASE WE'RE FORTUNATE, HERE AT THE GARDEN LIBRARY, TO HAVE THE ORIGINAL DESCRIPTION, THE ORIGINAL BOOKS ON THIS PASSION FLOWER, "THE WINGED PASSION FLOWER", WHERE IT WAS DESCRIBED. IT WAS NAMED THE "WINGED" PASSION FLOWER BECAUSE IT HAS... THE STEMS HAVE LITTLE WINGS. THERE ARE BETTER PICTURES IN THIS POPULAR BOOK, WHERE WE CAN REALLY SEE THE FLOWERS AND THE CHARACTERISTICS OF THE PASSION FLOWER THAT I WAS MENTIONING THAT LOOKS LIKE A CROWN OF THORNS WITH THE THREE NAILS THAT WERE USED FOR THE CRUCIFIXION, HENCE CALLED "PASSION FLOWER." SO THE PLANT, BECAUSE OF ITS BEAUTY, BECAME VERY POPULAR IN EUROPE. AND AS MANY PASSION FLOWERS, THEY ARE CULTIVATED (OR WERE CULTIVATED) THERE FOR MANY YEARS. HERE AT THE GARDEN WE HAVE, FOR EXAMPLE, THIS COLLECTION WHICH WAS MADE IN THE MIDDLE OF THE 1800'S IN "MINIATURIZING BRAZIL". SO WE KNOW THAT THE ORIGINAL PLANT COMES FROM THAT REGION. AND THEN, LATER ON, ONE OF OUR CURATORS COLLECTED A MORE RECENT SPECIMEN IN THE SAME AREA. SO, WE HAVE THE VERY OLD SPECIMEN AND A NEW COLLECTION. SEEING THAT, YOU KNOW THE PLANT STILL EXISTS THERE. AND WE CAN USE THE INFORMATION FOR DIFFERENT DATA ABOUT GEOGRAPHY OF THE SPECIES.

Grycz>> THIS IS A FIRST INSTANCE OF PUBLICATION: IT'S A CULTIVATED FLOWER FOUND IN ENGLAND. THEN AN ILLUSTRATION THAT IS REMARKABLE FOR ITS FIDELITY. (ONE WOULD NOT MISTAKE IT AS THE FLOWER WE LOOKED AT IN THE GARDENS.) AND, THEN, ACTUAL SPECIMENS TAKEN YEARS APART IN BRAZIL. SO, AS A BOTANIST, YOU HAVE ALL YOU NEED [RIGHT HERE] FOR YOUR "PROVENANCE", LET'S SAY, OF RESEARCH ABOUT THIS PLANT.

Ulloa>> YES, WE ARE VERY FORTUNATE HERE. VERY FEW BOTANICAL INSTITUTIONS ARE PRIVILEGED LIKE THE GARDEN TO HAVE A VERY LARGE HERBARIUM WITH A LARGE REPRESENTATION OF MANY PLANTS FROM DIFFERENT PARTS OF THE WORLD, AND ESPECIALLY [TO HAVE] THE LIBRARY. A BOTANICAL LIBRARY LIKE THIS ONE IS ONE-IN-THE-WORLD THAT HAS, MORE OR LESS, ALL OF THE BOTANICAL LITERATURE THAT WE NEED FOR OUR WORK.

Holland>> A LOT OF OUR EARLIEST WORKS IN OUR COLLECTION... ANYTHING--WHAT CAN WE SAY?--ANYTHING BEFORE LINNAEUS EVEN, NOT QUITE, BUT CERTAINLY YOU GET INTO THIS PERIOD, THIS BOOK WAS PRINTED IN 1542, THIS IS FUCHS' "DE HISTORIA STIRPIUM". A LOT OF THOSE BOOKS HAD TO DO WITH MEDICINAL USE OF PLANTS.

Holland>> WE GO BACK TO THE HISTORICAL LITERATURE AND THE EARLIEST ACCOUNTS OF SOMETHING OR ANOTHER, WHETHER IT BE A PLANT OF A REGION OR THE EARLIEST ACCOUNT OF A PARTICULAR PLANT OR A GROUP OF PLANTS.

Holland>> HERE'S ANOTHER INTERESTING EDITION OF FUCHS' "DE HISTORIA STIRPIUM". THIS IS A SMALL POCKET EDITION, IF YOU WILL.

Grycz>> HA!

Holland>> IN THIS PARTICULAR CASE, THIS ONE HAS JUST THE ILLUSTRATIONS--SMALL WOOD BLOCK ILLUSTRATIONS OF ALL THE PLANTS--WITH THEIR NAMES LISTED IN LATIN AND GERMAN.

Grycz>> EXCELLENT.

Holland>> A POPULAR FIELD GUIDE, THEY (THE PHYSICIAN) MIGHT HAVE CARRIED WITH HIM, EITHER IN THE FIELD TO COLLECT HIS PLANTS, OR POSSIBLY TO THE APOTHECARY.

Grycz>> YEAH.

Bussman>> IF WE TRY TO FIGURE OUT WHICH PLANT SPECIES HAS BEEN USED AS A MEDICINE, WE NEED TO KNOW EXACTLY WHAT PLANT SPECIES THAT IS. THAT'S WHAT THE HERBARIUM HELPS US WITH. WE HAVE SIX MILLION SPECIMENS TO COMPARE TO. NOW THE LIBRARY'S EXTREMELY IMPORTANT TOO, ESPECIALLY OUR OLD BOOK COLLECTION, BECAUSE KNOWLEDGE ABOUT USEFUL PLANTS HAS, TO A LARGE EXTENT, DISAPPEARED OVER THE LAST HUNDRED YEARS. SO WE HAVE TO GO BACK TO BOOKS AND EXACT DESCRIPTIONS AND MORE SO EXACT DRAWINGS OR PAINTINGS. THESE GUYS KNEW WHAT THEY WERE DOING. THEY DREW THE PLANTS VERY NATURALLY. SO WE CAN ACTUALLY USE THOSE OLD THINGS TO IDENTIFY, OR TO FIND, WHAT MIGHT STILL BE THERE NOWADAYS.

TAKE THE EXAMPLE OF PERU. WE HAVE ABOUT 500 MEDICINAL PLANTS WE'RE WORKING WITH. DESCRIPTIONS OF ALMOST ALL OF THEM ARE IN 500 YEAR OLD COLONIAL "CHRONICLES". SO THAT'S WHY LIBRARIES ARE EXTREMELY IMPORTANT FOR US TO WORK WITH.

Grycz>> THE MISSION OF BOTANY IS NOT JUST TO PRESERVE THE PAST. IT SHAPES OUR FUTURE. FEW PLACES ARE BETTER SUITED TO FULFILL THESE MISSIONS THAN THE THREE LIBRARIES IN ST. LOUIS, MISSOURI: "THE LIVING LIBRARY OF HORTICULTURAL DISPLAY," "THE LIBRARY OF PRESERVED PLANT SPECIMENS," AND "THE LIBRARY OF PRINTED MATERIALS" THAT HAS COLLECTIONS THAT INCLUDE TRAVEL DIARIES TO MEDICAL JOURNALS, FIELD SKETCHES, FINE ART, AND HISTORICAL RARE BOOKS. NONE OF THESE LIBRARIES STANDS ALONE. TOGETHER THEY PROVIDE THE RESOURCES FOR ANALYSIS AND EXPERIMENTATION... TO END HUNGER, TO PROTECT CROPS FROM GLOBAL WARMING, AND TO BETTER UNDERSTAND THE NUTRITIONAL AND MEDICINAL PROPERTIES OF PLANTS. THE MISSOURI BOTANICAL GARDEN'S LIBRARY IS A GREAT LIBRARY--NOT BECAUSE IT SERVES, SO WELL, THE LOCAL ST. LOUIS COMMUNITY, BUT--BECAUSE IT LINKS TO WORLDWIDE USERS THROUGH ITS DATABASES, AND [BECAUSE IT] COLLABORATES WITH INSTITUTIONS AROUND THE WORLD WHICH CAN NOW ELECTRONICALLY JOIN THEIR SEPARATE COLLECTIONS INTO ONE, LARGE, GLOBAL, AND IMMENSELY USEFUL, "VIRTUAL LIBRARY". I'M CHET GRYZ. JOIN US NEXT TIME WHEN WE VISIT ANOTHER LIBRARY ON "GREAT LIBRARIES OF THE WORLD".

(ANIMUSIC.COM THEME SONG PLAYING)