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About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

The Academy of Natural Sciences

of Philadelphia

Founded 1812

Has elected

Dr. Theodor Philipp Haas

an Annual member

this 24th day of September 1948

Chas M. Richards President

Jas E. Barnes Secretary

NATURALISTS' FIELD CLUB

First Flowering Dates For Early Spring Plants
(Progressively Arranged For Vicinity Of Philadelphia)

Average	Common Name	Scientific Name	Early	Late
Jan. 17	Skunk Cabbage	Spathyema foetida	1/1	2/22
Feb. 15 ?	Chickweed	Stellaria media	1/23	3/28
Mar. 13	Silver Maple	Acer saccharinum	1/19	3/21
" 25	Red "	" rubrum	2/23	3/28
" 25	Alder	Alnus rugosa	3/21	---
April 1 ?	Dandelion	Taraxacum officinale	3/27	---
" 3	Cottonwood	Populus deltoides	3/12	4/14
" 5	Arbutus	Epigaea repons	2/28	4/20
" 8	Bloodroot	Sanguinaria canadensis	3/18	4/19
" 9	Hepatica	Hepatica americana	3/18	4/15
" 10	Spice Bush	Benzoin aestivale	3/21	4/26
" 10	Grape Hyacinth	Muscari botryoides	---	---
" 10	Bluets	Houstonia coerulea	3/30	- -
" 10	Spring Beauty	Claytonia virginica	3/21	4/24
" 10	Rue Anemone	Anemonella thalictroides	3/20	4/22
" 12	Ground Ivy	Glechoma hederaceae	4/7	---
" 12	Blue Violet	Viola papilionaceae	3/17	5/11
" 15	Early Saxifrage	Saxifraga virginiensis	---	4/20
" 15	Dutchman's Breeches	Bicuculla cucullaria	---	---
" 18	Wood Anemone	Anemone quinquefolia	---	---
" 18	Star Flower	Trientalis americana	---	---
" 20	Moss Pink	Phlox subulata	---	---
" 23	Jack-in-the-Pulpit	Arisaema triphyllum	4/7	5/1
" 23	Faun Lily	Erythronium americanum	3/23?	---
" 25	Wild Ginger	Asarum canadense	---	---
" 25	White Violet	Viola lanceolata	---	---
" 25	Yellow "	" pubescens	---	---
" 25	Small-flrd.Crowfoot	Ranunculus abortivus	---	---
" 25	Toothwort	Dentaria laciniata	---	---
" 26	Golden Club	Orontium aquqticum	---	---
" 28	May Apple	Podophyllum peltatum	---	5/7
" 28	Dogwood	Cornus florida	3/28	5/11
" 30	Cranebill	Geranium maculatum	---	---
May 5	Lungwort	Mertensia virginica	---	---
" 5	Waterleaf	Hydrophyllum virginianum	---	---
" 7	Jacob's Ladder	Polemonium reptans	---	---
" 9	Wild Lily of the Valley	Maianthemum canadense	---	---
" 10	Common Buttercup	Ranunculus bulbosus	---	---
" 12	Star of Bathlehem	Ornithogalum unbellatum	---	---
" 12	False Spikenard	Smilacina racemosa	---	---
" 15	Solomon's Seal	Polygonatum biflorum	---	---
" 15	Dwarf Ginseng	Panax trifolium	---	---
" 15	Wild Sarsaparilla	Aralia nudicaulis	---	---
" 15	Columbine	Aquilegia canadensis	---	---
" 15	Daisy	Chrysanthemum leucanthemum	---	---

(It is hoped that the plant lovers using this list will make corrections, additions and suggestions, and send these to the Secretary of the Naturalists' Field Club, University of Pennsylvania.

THE ALPHA SIGMA BULLETIN

Published monthly at the Philadelphia College of Pharmacy and Science by the Alpha Sigma Chemical Society
Roselyn H. Volk - Editor
January 1944
Vol. 2; No. 3

New Year's Message

The New Year has begun, but it's still not too late to wish you all the proverbial " Happy New Year ". Thanks are extended to all members and non-members who have handsomely contributed to this paper. Let the motto for '44 be : Keep on writing!

****

Abstracts and Reports

Last month we promised you a report on the lecture presented by H. W. Leverenz on Electronic Applications of Luminescent Materials. The following is a translation of the report made by Dr. Haas. Anyone desiring to see the original may contact the editor.....

The speaker started with the fact that the light which impinges on a crystal has a ~~longer~~ shorter wave length than the emitted one. If now, the luminous substance is illuminated by ultra-violet light, the possibility arises (depending on the chemical composition of the phosphor) that it will emit the greater part of the light spectrum. Indeed, we have seen all the colors of the spectrum up until the blue end. In explanation, the speaker used chalks containing phosphors in order to write on the board, The hall was darkened and the blackboard illuminated with ultra-violet light. The speaker's script appeared luminescent in green, orange, white, yellow, red, and blue colors. These compounds are mostly sulfides. The speaker did not refer to CaS, but only to MgS. Much of the discussion was limited on account of the war.

The speaker explained that MgS and 1% NaCl give green light. This small increment of the sulfide appears to be the deciding factor for the color of the emitted light. For this purpose, a great part of the elements of the periodic system were tried out, partly with success and partly with bad results.

There are many of these phosphors, all of which are entirely inorganic materials. Silicates also seem to be useful.

It is possible to make phosphors which cease glowing immediately after turning off the radiation, and also others which glow for many hours after radiation has ceased. Heating, and cooling (with liquid air) interrupts the function of the phosphors. Cathode rays have the same effect like ultra-violet light. As already mentiond, the emitted light may have the colors ranging from red to blue. By mixing, it is possible to make a cold, completely white light by the additive effect of the lights produced. This phenomena is employed in the tubes which are used in television, and in the fluorescent lights which are used in shop windows and war plants. In these latter tubes the inner side of the glass is covered by substances which give off yellow and blue components. The Hg vapor arc is used as a source of light. This emits ultra-violet light.

Phosphors which have the after-glow are used in airplanes and in u-boats. Not mentioned in the lecture was the use of these materials in luminous watch diels. In Germany ZnS is used plus mesothorium as the sensitizer. .....Dr. Haas.

Penicillin

Dr. Charles Church of the E.R.Squibb Company and formerly director of of medicine at the university, was the guest speaker at the regular meeting of the American Pharmaceutical Society (Phila. Section) held at our school. Dr. Church's subject was the timely one of penicillin therapy. The following is an abstract of the lecture, which was accompanied by slides illustrating various methods of treatment and photographs of cases of various diseases.

The colorless plant, Penicillium notatum, from which penicillin is obtained, has been known for some time. However, it was not until 1929 when Professor Fleming, in England, began research that he found that the crude extract from the plant inhibited the growth of certain bacteria. It is claimed by others that the properties of penicillin as the extract had been known before, but never-the-less most of the credit for the origin of the use of penicillin has been given to Professor Fleming. One interesting example of a very early use of penicillin (1629) was illustrated in its use by the physician of the King of England . An extract was made from the mould which formed in the skull of a person who was hanged for murder. The extract was found to be quite efficient at the time.

Penicillin is extracted (from the culture in which it is maintained at 72°) by the use of ethyl acetate, chloroform and ether. Although Dr. Church could not describe the details of the extraction, he did say, however, that the process is only 40% efficient. Penidillin is now being produced by 20 different firms, still the amount which reaches civillian consumption is a very small percentage.

In doing various experiments Dr. Defoe, the American bacteriologist found that penicillin was almost specific for the killing of certain bacteria such as Staphlococcus aureus and viridis, Pneumonococci and Gonnicci. However, it was found that penidillin had no effect whatsoever upon certain influenza organisms, no matter how long the mixture stood or what the concentration of the extract was.

Penicillin potency is measured by the oxford unit which is the amount of the drug in 50 cc. of crude extract which will prevent the growth of certain specific Staphlococcus organisms. With the discovery of another salt of the drug , it is felt that a new standard for the potency will be initiated.

An interesting idea advanced for the production of the drug is the its recovery from the urine of patients to which it has been administered since the drug passes through the urinary tract in tact. However this procedure would hardly be profitable using present methods of extraction.

Dr. Church showed some slides which indicated the comparative effectiveness of the sulfa drugs (particularly sulfanilimide, and sulfathiazole) with penicillin. One of the graphs showed that the presence of p-amino benzoic acid, produced in the body almost total inhibition of the action of the sulfa drugs, but has almost no effect on the action of penicillin.

Other slides showed graphs of case histories of U.S. soldiers who were suffering from chronic osteomyelitus. These charts showed that penicillin cured all these cases within a maximum of 16 days, where, before the use of penicillin, the cure of this disease was unknown. Penicillin was used locally in conjunction with intravenous and intramuscular injections in the cure of this ailment. But (Dr. Church made it quite emphatic) oral and rectal administration are quite ineffecti-

Dr. Church concluded the lecture with the statement that this drug is not to be considered a cure-all. But with the coming of more investigation, the drug would become more and more effective against diseases for which penicillin has not as yet been tried.....

.....I. Tennenbaum

Science Review of '43
culled from here and there
in ramblings thru
Science News Letter.

Biotin , recently discovered vitamin of the B group, was made synthetically , thus affording more ample supplies for research in human nutrition. .....(See Vol. 2, No.2 of this bulletin).....

A new and more economical alcohol process for the recovery of glycerin from fats in soap-making was developed.

A new kind of synthetic rubber, Perecon, was developed which will be valuable as a special replacement for natural rubber, particularly in the aircraft industry.

Starch acetate , anew plastic chemical for use as slaccquer and water-resistant cohesive, was made from potatoes.

A new, more economid fluorescent material, composed of ZnO and V_2O_5 was developed which transforms invisible ultraviolet rays into warm yellow visible light.

The smallest "quantum" of energy, the amount that would be emitted by a single atom making one vibration per second, if that were possible, has been somewhat enlarged by new measurements made by X-rays and agrees satisfactorily with results calculated from the atomic theory

Rhenium, rare chemical element, formerly aGerman monopoly since its discovery in 1925, was found in dust from the flues of Mo ore-roasting plants in a western state.

A new phosphorescent microscope for the examination of object by their own short lived glow after ultraviolet radiation was devised.. .....(see article on first page).....

New deposits of the rare metal tantalium , used in surgical, electrical and temperature- control apparatus, were found in New Mexico

Dr. Harold C. Urey, Nobelist and professor of chemistry at Columbia University, was awarded the Franklin Medal by the Franklin Institute for his discovery and production of heavy hydrogen.

Better liqid chlorine is made by an improved process: The small amounts of sulfuric acid left inthe chlorine at the end of the customary production process is removed by passing Cl thru a mass of prepared coke, leaving the Cl harmless to the compressors.

Rainbow plating is a term applied to a new process by which a brilliant multi-colored electroplate is obtained from molybdate solutions.The metallic coating of Mo reflects light in brilliant color much in the same way as a soap bubble.

Ancient ocean beds in Idaho and Wyoming were found to contain vanadium estimated at a million tons

Radar, a locator using ultra-high frequency radio waves, although developed earlier, was announced.

SONG OF THE CANARY

I worship God and pour my song
Upon His praise, the whole day long.
There's none to tell me what to trill,
I run my cadences at will
For Food I never have to search
No danger haunts my eerie perch.
Secure in my gilded cage
The full four freedoms I engage.

But Ah! my friends, and Oh! my friends,
With just these four, my freedom ends.
The God that gave me right to sing
Gave me as well - the gift of wing.
Open my cage door - Watch me fly
Up to my own belonging sky
What can four freedoms mean to me
Unless I have my liberty.

Martin Sale Died with 57 years

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Borrower's Number 11413

Name Theodor Philipp Haas Ph.D.
Botaniker.

Address 712-14 Spruce St.
Phila. College of Pharmacy & Sc.

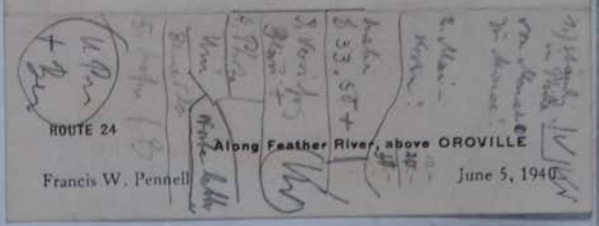
Call Number of Book 581.962.
W. 824.

Author Franz Woenig.

Title Die Pflanzen der
Alten Aegypter

The Academy of Natural Sciences of Philadelphia

CALIFORNIA
Butte County



ROUTE 24

Along Feather River, above OROVILLE

Francis W. Pennell

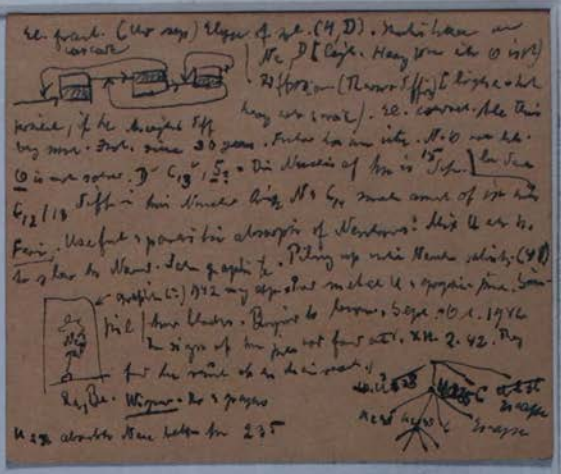
June 5, 1940

Acacia formicarum Harms, "Flute-Acacia"

The basis! of the leaves very often are transformed into galls, at first green, later dry, black swellings, caused by the sting of ~~[illegible]~~ Gall-Insects. These galls later become inhabited by the ant Cremato-gaster tricolor Gerst. The wind produces by them aparticularly, aeolsharp like sound,

these galls [illegible]

~~Masai steppe~~
Nairobi ~~[illegible]~~



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Bavarian Loyalist Party Seeks Restoration of King

MUNICH, Jan 26 (AP)—The Loyalist Party, claiming a membership of 250,000 and plumping for reinstitution of monarchy in Bavaria, has been granted a license by American Military Government.

The Loyalists, led by Baron Franz von Redwitz, advocate returning the ancient Wittelsbach family to the Bavarian throne.

They urge the alliance of Bavaria with other independent German states in a league of European States.

The party promises a plebiscite on the monarchy question as soon as it might come to power. Its registration was too late for tomorrow's elections.

The new party's platform is in direct opposition to the Potsdam Declaration and its two major aims, a dispatch to the New York Herald Tribune said. Creation of an independent state of Bavaria opposes the Potsdam decision that Germany should be a political and economic unit, and the 17th Century doctrine of the divine right of kings goes against the Potsdam goal of democracy for Germany.

NO CANDIDATE NAMED

Purpose of the party is listed as the "re-establishment of the kingdom of Bavaria." No candidate for the throne is named in the program, the Herald Tribune said, but Prince Rupprecht is the one most frequently mentioned in Royalist circles.

The 1,200-word program, which had to be submitted to Military Government with the application for approval of the party, begins: "The Bavarian people experienced the happiest times in its history while Bavaria was an independent state under the crown of the House of Wittelsbach."

cleft-crafting	= Spaltpfropfung
entire-margined leaf	= ganzrandiges Blatt
bending	= Krümmung
superior ovary	= oberständiger Fruchtknoten
inferior "	= unterständiger "
spurred	= gespornt
numerous stamens	= zahlreiche Staubfäden.
blunt	= stumpf
accessory fruits	= Scheinfrüchte (Apfel)
eyespot	= Augenfleck (Flagellatae)
gemmae cups	= Brutkörper
club-moss	= Bärlapp
deciduous forest	= Laubwald
mildew	= Mehltau
host	= Wirt
carrion	= Aas
defoliation	= Ablauben Fallen der Blätter
cutting	= Ableger
to die off	= absterben
to [illegible] repulse	= abstossen
axiliflorous	= achselblütig
arable soil	= Ackerboden, Ackererde
susceptable	= anfällig
initial stage	= Anfangsstadium
tontake root	= anwurzeln
to adhere	= anwachsen
apple core	= Apfel-Kernhaus
interspecific hybridation	= Artkreuzung
afforestation	= Aufforstung
center of distribution	= Verbreitungsherd
Distribution barrier	= Verbreitungs hindernis
Agency of distribution	= " mittel
prostrate	= ausgebreitet
emarginated	= ausgebuchtet
laciniate	= ausgefranst
external surface	= Aussenfläche
outer membrane	= Aussenhaut
capacity to withstand drying	= Austrocknungsfähigkeit.
winter killing	= Auswinterung
weathering	= Auswitterung
enation, excrescence	= Auswuchs
branching	= Auszweigung, Verzweigung.
dendroid, dendroform	= baumartig
timber-line	= Baumgrenze
bacillus carrier	= Bazillen-Träger
angiospermous	= nacktsamig
adaptability	= Beeinflussbarkeit
attending or companion plant	= Begleitpflanze
aristate	= begrannt
delimitation	= Begrenzung
conception	= Begriff
favored	= begünstigt
inception, incipient	= Beginn, beginnend
dasyphyllous	= behaartblättrig
accessory bud	= Beiknospe
The anther which furnished food for the visiting insects	= Bekömstibungs-Anthere (Cesalpiniaceae)
load, loading restistance	= Belastung, Belastungswiderstand
frondous, leafy	= belaubt
[illegible]	= [illegible]

SECOND ANNUAL NATURE CAMP WEEKEND
CAMP OCKANICKON, MEDFORD LAKES, N.J.

Saturday and Sunday, June 9 and 10, 1945

Sponsored by The Academy of Natural Sciences of Philadelphia

THE PLACE - Camp Ockanickon (owned and operated by the YMCAs of Burlington, Camden, Gloucester and Monmouth Counties); at the edge of the New Jersey Pine Barrens. The camp is located 20 miles east of Camden and 4 miles southeast of Medford, N.J. Several hundred acres of pine woods lakes, and cedar swamps comprise the campsite.

REGISTRATION - A fee of $5.00 will cover lodging and two meals Saturday and three Sunday. No refunds will be made for cancellations after June 6. Facilities of the camp are limited, so early return of the attached application blank is recommended.
This is a camp for adults. A limited number of children will be admitted if properly supervised.

WEATHER - Cold nights are the rule. The camp will be held "rain or shine." Adequate shelter, open fireplaces, and a full program of games, exhibits, classes, slides, and movies insure a busy, interesting time even in rainy weather.

TRANSPORTATION- The 8:50 a.m. and 1:12 p.m. Medford Lakes buses leaving from the Camden Ferries will go directly to the camp entrance. Round-trip bus fare is $1.05. The camp truck will pick up luggage at the Ferry at 8:45 and will meet the 1:12 p.m. bus at the camp entrance. Temporary road signs will guide persons in private cars. Persons planning to drive are urged to take along as many other campers as their space permits, thus relieving congestion on buses. Return buses will leave the camp at 6:30 p.m. Sunday.

CHURCH - A service will be held in the camp's lovely outdoor chapel. There will be transportation to the Catholic Church in Medford Lakes.

FACILITIES - The camp has a screened and electrically lighted mess and recreation hall and all modern camp conveniences. Screened cabins centrally located, each have four double deck canvas cots. The cabins are not lighted. Boating and swimming will be permitted at specified hours. Well-balanced, substantial meals are prepared in the modern camp kitchen. Campers take turns serving and clearing the table. Groups will be seated by cabins.
Assignments to cabins will be made by Mrs. Lapow, at headquarters. First aid equipment is located there. The camp physician resides at Medford and is on call.

PHONE - Telephone at headquarters is Medford 4403. Calls at mealtimes can be made over Medford 4831.

YOU WILL NEED TO BRING - Flashlight, toilet articles, mosquito "dope," and bedding. As many as four blankets are comfortable on cold nights. Swimming suit, cameras, binoculars, etc., as desired. Raincoat, depending on weather forecast.

ACTIVITIES - The program is being set up to give everyone a choice of activities and leaders and to work in small groups. There will also be certain talks and demonstrations that everyone will have a chance to hear. A detailed program will be distributed to the campers when they arrive. Special groups will be organized to study wild flowers, microscopic and aquatic life, birds, insects, amphibians and reptiles, nature photography, animals at night, and the stars. Displays of specimens will be arranged Sunday afternoon.

STAFF - Director of Education, Charles E. Mohr, Academy of Natural Sciences of Philadelphia, in charge. Dr. Edgar T. Wherry, University of Pennsylvania, plantlife. Dr. Robert B. Gordon, State Teachers College, West Chester, formerly director of the Allegheny School of Natural History, plantlife, birds. Arthur C. LaDow, natura and camping counselor at Ockanickon, birds, amphibians and reptiles, nature photography. Mrs. LaDow and Miss Lorene McLellan of the Academy's staff, in charge of women's camp and general natural history. Dr. Theodor Haas, College of Pharmacy, aquatic plants and microscopic life. Edwin T. Moul, assistant in botany at the University of Pennsylvania, birds, plants, and insect life. Walter A. Freyburger, Jr., Delaware Valley Ornithological Club, birds, amphibians and reptiles, insects.

— — — — — — — — — — — — — — —

APPLICATION BLANK

(Please fill out, detach, and return to: Charles E. Mohr, Academy of Natural Sciences, 19th and The Parkway, Phila. 3, Pa.)

NAME_____(Age, if under 21)_____

MAILING ADDRESS_____

Enclosed: Check_____Money Order_____ for $5.00
(Payable to the Academy of Natural Sciences)

I plan to take the following bus from Camden on Saturday:

8:52 a.m. _____ 1:12 p.m. _____

I plan to drive to the camp_____ I will take with me the following persons_____I will have room for_____

I should like to be in the same cabin with_____

_____

I should like to take part in groups studying: Birds__Plantlife___

Insects__Aquatic and Microscopic Life__Amphibians and Reptiles___

Nature Photography__Animals at Night__Stars__

Bulletin
OF THE
Philadelphia College
of Pharmacy *and* Science

Vol. XLII NOVEMBER, 1949 No. 8

ATTENTION

Classes of
1895 — 1900 — 1905 — 1910
1915 — 1920 — 1925 — 1930
1935 — 1940 — 1945

The Spring Alumni Reunion Dinner, to be held in May, 1950, will feature reunions of the '5 and '0 classes. Members of the classes listed above will receive special notices from their reunion chairmen in due time, but now is the time to start plans to be in Philadelphia for this great occasion.

Members of the other classes are, of course, invited to the reunion dinner. Every graduate of the College is always welcome at any function of the Alumni Association.

Dr. William D. Baun, 1910, who also graduated in medicine from Jefferson Medical College, died recently at his home, 623 E. Allegheny Ave., Philadelphia.

President Ivor Griffith, 1912, addressed the fall meeting, Oct. 25, of the Northampton County Federation of Women's Clubs in Stone Church, Pa. His topic was, "Live Longer and Like it."

On Nov. 3, Dr. Griffith was the speaker at the Annual Ladies' Night of the Kiwanis Club of Olney in Philadelphia.

George F. Wagner, 1904, for 40 years proprietor of a drug store at 5812 Greene St. in Philadelphia, died Nov. 9.

Walter E. Brown, 1904, died recently in Wilmington, Del.

Hanford B. McGehee, 1897, died in Norfolk, Va., Aug. 28, 1948.

Pictured here are parts of a giant water lily named after Queen Victoria, but native to the LaPlata River area in Paraguay, being prepared for exhibition in the Museum of the Philadelphia College of Pharmacy and Science by the Curator, Dr. Theodor P. Haas.

This plant, the largest water lily in the world, attains a normal leaf length of six feet, and three or four men are required to bring specimens ashore.

In this country, only a few growing specimens may be found. This specimen, obtained alive from the National Park Service of the U. S. Department of Interior in Washington, D. C., is the only known mounted lily of its type in Philadelphia.

Russell T. Blackwood, Jr., 1919, has been re-elected Vice-President of the Federal Wholesale Druggists' Association. He is general manager of the Philadelphia Wholesale Drug Co.

Dr. Harvey B. Weiss, 1898, a physician in Philadelphia for 50 years, died Oct. 27.

Richard H. Rogers, M. C. C. 1916, died of a heart attack Oct. 13. He resided at 12 S. Quincy Ave., Margate, N. J.

J. Sherman Cooley, 1885, for 53 years a pharmist in Flemington, N. J., died recently.

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SCIENCE HELPS THE GARDENER

New Hormones and Vitamins Are Now Applied Effectively Either to Destroy or to Stimulate Plant Growth

By JAMES G. HORSFALL
Director, Connecticut Agricultural Experiment Station

THE atmosphere around the garden is getting pretty thick with scientific talk of hormones and vitamins, blossom thinners, apple stickers, wound healers, root promoters, weed killers, fungus fighters, and bug blasters—to say nothing of such things as tetraploids. The new developments fascinate some gardeners, scare many and confuse others.

All three reactions probably have the same source—newness. Many recent developments, coming straight out of the unknown, carry with them an uncanny quality. They show that plants will do things we did not believe possible.

The practical gardener finds it helpful to know some of the theory behind all this. For instance, he is able now to grow seedless tomatoes, keep the blossoms from falling off the apple tree, make cuttings root quickly, and kill weeds in the lawn, all by spraying with a hormone. Just how it works and whether or not it is the same hormone that does all these things are questions he would like to have answered.

Botanical Questions

Botanists approached this the other way round. It was a set of much more theoretical questions that led them to practical applications. Why, they wondered, do plants grow in characteristic shapes? What, for instance, makes a tree grow faster upward than outward?

Examination showed that the upper shoot buds grow more rapidly than the side buds. Then someone wondered why this should be so. The problem defied solution

When the upper bud on a plant is removed, the side ones are stimulated—as every zinnia fancier knows. Finally a chemical was found. Since its composition was unknown, it was called "auxin." The upper bud makes auxin. It moves through the sap stream, lodges in the side buds and slows down or even stops their growth. Such fruits were firmer, less soupy.

After still more years of research, auxin was purified, then analyzed, and finally synthesized in the laboratory. It was found to be indole butyric, sometimes indole acetic acid.

Hormone Effects

The research began to snowball and hundreds of chemical relatives were made and tested for "hormone" effects. Naphthalene acetic acid, a variation on the original, was found to stimulate root growth, and the way of the gardener became easier. His centuries-old problem of rooting cuttings was simplified. The same chemical was found to prevent or delay the formation of abscission layers in plants. The fruit farmer profited from this, because he could keep his crop of apples on the tree a few more days to permit thorough ripening. It was learned that tomato blossoms would be speeded into setting fruit without seed if sprayed with the same hormone.

The most dramatic development in plant hormones is that of selective weed killing. Early in their development it was noted that some hormones were destructive. This was explored during the war as a biological warfare project, but it was too late for use on enemy crops.

The most practical chemical turned out to be phenoxyacetic acid plus chlorine, called 2,4-D for short. This seems to over-stimulate the weeds to death. Results seem nothing short of miraculous. A lawn yellowed with dandelions and pocked with plantains can be restored to beauty in a single year, almost with one treatment. The catch is that 2,4-D is no respecter of tomatoes and other herbaceous plants. Carelessness in spraying will result in plenty of unwanted damage.

Chemicals that speed plants up or slow them down, wonderful as they are, are no more impressive than some of the new ways of killing insects. For instance, DDT poisons insects ingeniously. Unsuspecting Jap beetles walking over a DDT-sprayed leaf absorb the chemical through their padded feet and die of nervousness. Benzene hexachloride poured into the soil slows grubs down. Finally they just give up and die.

Plant Reproduction

Botanists have also tampered with plant reproduction. Colchicine, an extract of a tropical lily, was tried on plants to see what it would do. A remarkable phenomenon took place. Normally a plant has what is called 2X chromosomes, or, very roughly, two sets of inherited characteristics. Upon treatment with colchicine it acquires four. It is a giant. We now have these giants, called tetraploids, of carnations, snapdragons, zinnias and other flowers.

All of this changes the garden and the gardener's work. Flowers are bigger, bugs are fewer, fruit stays on the tree instead of falling off. Out of the purely theoretical ponderings of scientists some of it comes, and still more from the experimenter's habit of trying out chemicals just to see what will happen.

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