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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.

SMITH COLLEGE
NORTHAMPTON, MASSACHUSETTS
DEPARTMENT OF BOTANY

February 21, 1947

Mr. T. H. Goodspeed
University of California
Berkeley, California.

My dear Goodspeed:

I am enclosing letter from Em. Larose. Perhaps you
can help him out or pass the letter on to someone who can.

With best wishes,

Sincerely yours,



Albert F. Blakeslee.

MINISTÈRE DE L'AGRICULTURE

STATION DE RECHERCHES POUR

l'Amélioration des Plantes

A GEMBOUX (Belgique)

Téléphone: Gembloux 61.300

N° 76678...

A rappeler dans la réponse

..... ANNEXE...

Gembloux, le 10 décembre 1946. 19.....
(Institut Agronomique de l'Etat)

Monsieur Albert F. BLAKESLEE,
Carnegie Institution of Washington
Department of Genetics,
Cold Spring Harbor, N.Y. (U.S.A.)

Monsieur le Directeur;

Désirant amplifier notre collection de variétés de Tabac, nous serions heureux de recevoir quelques lots de graines de différentes variétés cultivées dans votre région et également, si possible, des semences d'autres espèces du Genre Nicotiana.

Eventuellement, pourriez-vous également nous procurer quelques semences des formes spéciales (Amphidiploïdes, par exemple) que vous auriez obtenues.

Nous vous remercions à l'avance de ce que vous pourrez faire à ce propos et nous mettons entièrement à votre disposition pour vous adresser, de notre Station, ce qui pourrait vous intéresser.

Nous vous prions, Monsieur le Directeur, d'agréer l'expression de nos sentiments très distingués.

Le Directeur:

Em. Larose

Em. LAROSE.

COPY

Smith College
Northampton, Mass.
February 21 1947.

Professor Em. Larose
Station de Recherches pour
l'Amélioration des Plantes
à Gembloux, Belgique.

My dear Professor Larose:

I am in receipt of your letter of December 10th upon my return from a two-months' trip in India. I do not have any seeds of *Nicotiana* since I am not working with these forms at all at the present time. I am taking the liberty of sending your letter on to one who may be able to supply you with what you desire.

With best wishes,

Sincerely yours,

Albert F. Blakeslee.

Till utländsk ledamot av Akademiens 6. klass få under-tecknade härmed föreslå professorn i botanik vid University of California, Berkeley, Thomas Harper Goodspeed. Goodspeed, som nu är i 70-årsåldern, är en av Amerikas främsta botanister och är internationellt välkänd särskilt på grund av sina omfattande under-sökningar över släktet *Nicotiana*. Huvudsyftet med dessa arbeten har varit att utreda det stora släktets systematik och att draga slutsatser rörande arternas fylogeni. Detta gäller särskilt de poly-ploida *Nicotiana*-arterna och bland dem i första hand den tetra-ploida arten *N. tabacum*, vars kromosomkonstitution och uppkomst från två diploida arter Goodspeed klarlagt med hjälp av kombinerat taxonomiska, växtgeografiska, cytologiska och experimentella metoder. Hans bearbetning av släktet *Nicotiana* med cyto-taxonomiska metoder är ett värdigt motstycke till vad Goodspeeds nyligen avlidne universitetskollega E.B. Babcock utfört hos släktet *Crepis*.

Medan en del av Goodspeeds medarbetare (särskilt Roy Clausen) tagit upp och fullföljt de genetiska aspekterna av *Nicotiana*-arbetet har Goodspeed såsom professor i botanik och föreståndare för universitetets botaniska trädgård lagt huvudvikten vid den systematiska utredningen av släktet, vilket resulterat i sådana skrifter som "*Nicotiana phylesis in the light of chromosome number, morphology, and behavior*" (1934) och "*Cytotaxonomy of Nicotiana*" (Bot. Review 1945) samt slutligen hans 1954 utgivna verk "*The Genus Nicotiana*".

Ehuru Goodspeeds största insats gäller släktet *Nicotiana* har han emellertid gjort värdefulla insatser även på andra forskningsområden. Sålunda föreligger t.ex. från åren 1911 - 1919 en rad avhandlingar över gröningsfysiologi och temperaturens inverkan på fröets livslängd samt inverkan av lysgas på blomningen hos *Citrus* och *Nicotiana*. En annan skriftserie behandlar de kaliforniska arterna av släktet *Trillium* med avseende på morfologi, växtgeografi och vissa teratologiska egenskaper.

Under 1930-talet koncentrerade sig Goodspeed under en period på växtanatomiska undersökningar med hjälp av microincineration och utvecklade en speciell fixeringsteknik med frys-torkning i samband med dylika försök. Goodspeed har också utfört embryologiska och befruktningsbiologiska undersökningar, vilket bl.a. resulterat i arbetet "*Maturation of the gametes and fertilization in Nicotiana*" (1947). Ett annat starkt intresse har varit de biologiska verkningarna av bestrålning med radium och röntgen, på vilket område Goodspeed också är en av pionjärerna. Detta resulterade bl.a. i det sammanfattande arbetet "*Radiation and plant cytogenetics*" (Botan. Review 1939).

Goodspeed har särskilt goda relationer till svensk botanik därigenom att han 1922-1923 med hjälp av stipendium från

Scandinavian-American Foundation vistades i Stockholm, där han be-
drev studier på Otto Rosenbergs institution. Detta resulterade bl.a.
i en skrift "Opportunities for the study of Botany in Sweden", i
vilken han ger en översikt över avenska botaniska institutioner och
deras verksamhet samt uppmanar sina landsmän att utvidga det bo-
taniska samarbetet mellan Amerika och Sverige. Under sin långa verk-
samhet i Berkeley har Goodspeed också med största tillmötesgående
tagit emot många skandinaviska botanister. Då han dessutom och fram-
för allt intar en verkligt ledande ställning bland samtidens bo-
tanister på grund av sin djupgående och mångsidiga forskning anse
vi det vara synnerligen välmotiverat att nu invälja honom i KVA:s
botaniska klass.

Thank and
ack
B reimbursement
for photographs

Dr. Helen-Mar Wheeler
Department of Botany
University of California
Berkeley 4, Calif. U.S.A.

Dear Dr. Wheeler:

I was very pleased to receive your letter and to be able to do you a little service. Unfortunately, I am afraid I have not gained much available information as the result of my inquiries, in the Botanical Garden of Madrid, about of the type specimens of Nicotiana longiflora Cavanilles and Nicotiana crispa Cavanilles.

In the Cavanilles's herbarium we have only found two plants of N. crispa which photographs I enclose; from N. longiflora we have not found anything. The photograph show the label that was together with the plant, one is possible reading it easily, but another is not, in this is wrote "Nicotiana crispa L."

Please Write me again if you want more information or another thing which I can doing for you, this should be a great pleasure for me .

I am very thankful to you and Mis. Peter Blos for your present, the pretty book that you send me which remember me nice California country.

I am wishing to you a very happy and prosperous New Year.

My kind regard to yourself, Dr. Goodspeed and all my friends there.

Sincerely yours,

J. H. ...
I am wishing to you a very happy and prosperous New Year. My kind regard to yourself, Dr. Goodspeed and all my friends there. Sincerely yours, Dear Dr. Goodspeed, I have not gained much available information as the result of my inquiries, in the botanical garden of ... of the type specimens of Nicotiana glauca Cavendish and Nicotiana glauca Cavendish. In the Cavendish's herbarium we have only found two plants of N. glauca which photographs I enclose; from N. glauca we have not found anything. The photograph shows the leaf that was together with the plant, one is possible reading it easily, but another is not, in this is wrote "Nicotiana glauca Cavendish". Please write me again if you want more information. Another thing which I am doing for you, this should be a great pleasure to you. I am very thankful to you and his letter also for your present, the pretty book that you send me which reminds me nice California country.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF PLANT INDUSTRY, SOILS, AND
AGRICULTURAL ENGINEERING

DIVISION OF
PLANT EXPLORATION AND INTRODUCTION

~~RECEIVED~~ PLANT INDUSTRY STATION
BELTSVILLE, MARYLAND

February 19, 1953

INFORMAL

Mr. Richard I. Phillips, Consul
American Consulate
Salisbury, Southern Rhodesia, Africa

Dear Mr. Phillips:

There came to our division your Despatch No. 65, dated November 6, 1952, asking for three species of tobacco seed.

We were able to locate without too much delay the Nicotiana tomentosa, which was sent to you under despatch dated January 7. In this despatch we indicated we were attempting to locate the other two species. This letter is now conveying a very small packet of seed of Nicotiana tomentosiformis (under No. C-108) which was supplied through the courtesy of Professor T. H. Goodspeed, Director of the Botanical Garden of the University of California at Berkeley.

Further contact was made through Professor Roy E. Clausen of the Genetics Division of California University to obtain the Nicotiana digluta and we are informed that seed of this species is not available at present. Rather than carrying on the additional correspondence which would be required to locate this species—if available at all—we would prefer to wait until Professor Clausen might establish seed stocks.

I am writing this as an informal letter rather than through despatch since I felt it much easier to explain the situation by direct correspondence.

Sincerely yours,

Howard L. Hyland
For the Division

Enclosure
HLH:HDP

cc: T. H. Goodspeed
Roy E. Clausen

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
HORTICULTURAL CROPS RESEARCH BRANCH
BELTSVILLE, MARYLAND

July 14, 1954

Dr. Max M. Hoover
Plant Introduction Station
Iowa State College
Ames, Iowa

Dear Max:

Without digging out the earlier correspondence I am enclosing a small seed packet of Nicotiana maritima which you had apparently asked Dr. Hodge about sometime early in May. This was wanted by one of your cooperators and we were fortunate in locating the enclosed packet through Dr. T. H. Goodspeed of Berkeley, California.

I am not giving this small packet a PI number because it represents a portion of a collection which Dr. Goodspeed is carrying under his own numbers at the University of California Botanical Garden. I find that they also have a collection of 23 species of Nicotiana should you have some inquiry for material of this general use in the future.

I hope I haven't overlooked any particular point by sending this packet directly to you.

Sincerely yours,

*Thanks very much for the
seed list which should
prove helpful to us.*

HLH:feh

H.

Howard L. Hyland
Foreign Plant Exchange

cc: Dr. Goodspeed ✓

To Dr. Proskauer

6/7/49

Valparaiso -- Hotel Astur or better hotels in nearby and famous Vina del Mar. Dr. Edwyn P. Reed (Casilla 1802, or in telephone directory) is an old and valued friend with whom we are constantly in correspondence. His father was brought to Chile in 1870 to teach Natural History in the Naval Academy and married a Chilean woman. Edwyn is more English than Chilean, a delightful, somewhat uninhibited gentleman with a splendid family of seven sons. He is a distinguished amateur entomologist and knows the natural history of Chile in detail.

Santiago -- We like Hotel Crillon and if you can stand the street noises a room in the "old part" is most comfortable.

Arequipa -- The Government Tourist Hotel is more modern but Quinta Bates is world famous. In any case you should try to see Tia Bates and if you do please give her our love.

Lima -- We have always stayed in Hotel Maury but it might be a little too rundown for you. However, it is the best place to eat in Lima. Hotel Bolivar is the famous tourist spot but Hotel Crillon is newer and said to be better. Dr. Alberto Geisecke, American Embassy, would be friendly and helpful. His remarkable career as Alcalde of Cuzco, Rector of the University there, adviser to Ambassadors, etc, was written up in Readers Digest a year or two ago. Dr. Nicolas van der Walle (the Consulate of Holland can give you his telephone number) is an old friend of ours. He was retired some years ago as a doctor in the Dutch East Indies service and has been living in Lima. Do not hesitate to ask collecting assistance and advice from Dr. Alberto Leon, Director, La Molina Agricultural College and Experiment Station (15 miles east of Lima) and from Dr. Teodoro Boza B. who was Director of Agricultural Research for the Peruvian government and is now a Professor at La Molina. Boza speaks good English and has been in the United States a number of times. You should get into touch with him first and he will then make arrangements with Leon.

Cuzco -- Government Tourist Hotel is said to be excellent. Dr. Cesar Vargas Calderon is Professor of Botany at the University. He had a half year at U.C. on a U.S. government fellowship during the war. A typical serrano who has made something of himself in a rather Dark Ages intellectual environment.

In 1905 the late Dr. W. A. Setchell, long Chairman of the Department of Botany, began to collect species of the genus Nicotiana and varieties of N. tabacum, the tobacco plant of commerce. In 1909 T.H.G. undertook the further development of the species collection, in association for some years with Dr. R. E. Clausen, Chairman of the Department of Genetics. For the past 30 years the Nicotiana investigations in the Botanical Garden have been directed by T.H.G. toward complete analysis of the derivation of the 60 present day species. The results of this project have just been published by the Chronica Botanica Co. in a monograph, THE GENUS NICOTIANA: Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics. This volume consists of 6 Parts and contains 550 pages, 118 illustrations and 50 tables.

In successive Parts each of the types of documentation referred to in the subtitle is treated both factually and interpretively; finally the accumulated evidence is brought to bear on the author's conclusions concerning origins, relationships and evolution of the genus. These conclusions are ^{presented} expressed in charts tracing the evolution of Nicotiana from a pregeneric reservoir to its present day expression, ^{and also its ultimate} with the derivation of every species. ^(pictured) Based upon them the future of the genus is predicted.

Nicotiana is a New World genus, its species today native to North and South America, Australia and certain islands of the South Pacific. All evidence points to South America, where the majority of species occur, as the place of origin of the genus. Geologic history throws light upon interpretation of the present range of distribution of species there and in each of the other continents concerned and also established avenues of migration via Antarctica and Central America which are consistent with the tri-continental distribution of the genus, ^{from such S.A. centers of origin.}

^a The practically complete collection of species of Nicotiana, grown at

the Botanical Garden under uniform conditions, provided material for detailed studies of comparative morphology and cytology and for making over 150 interspecific hybrids in which analysis of chromosome behavior in the reproductive cycle gives significant indication of relationships.

The evidence from species distribution is found to correspond closely with the more fundamental ^{clines to} ~~indications of~~ relationship expressed in morphology, cytology and hybrid analysis, and the combined evidence points to evolution of the genus via two successive levels attained by repeated interspecific hybridization and chromosome doubling, with genetic differentiation on each level through such mechanisms as introgression and chromosome reorganization.

The final Part of the monograph, under joint authorship of T.H.G. and two Senior Botanists of the Botanical Garden staff, Helen-Mar Wheeler and Paul C. Hutchison, presents a complete reorganization of the taxonomy of the genus ^{and includes} ~~with~~ keys to subgenera, sections and species, detailed description and full page illustration of each species, range of its distribution and reference to specimens to be found in herbaria.

Essential for the success of the Nicotiana investigations were studies of species in their native habitats, ^{including} ~~charting~~ of their range of natural distribution and especially assembling in the Botanical Garden as large a proportion of the recognized species as possible. To this end T.H.G. directed 5 expeditions to South America where 10 species and varieties previously unknown were discovered and ~~seed of~~ many known ones was re-collected. The species native to Australasia were supplied by colleagues. Ultimately all but 4 of the 60 species and many varieties were in cultivation in the Botanical Garden to make a notably complete representation available for research on species origins and relationships.

Support of the Nicotiana investigations was for many years provided by the Committee on Research. Grants from numerous Foundations and scientific institutions in this country and abroad and the generosity of friends of the University made possible the South American expeditions and other aspects of this project.



REPÚBLICA ARGENTINA
SECRETARÍA DE ESTADO DE AGRICULTURA Y GANADERÍA DE LA NACIÓN
INSTITUTO NACIONAL DE TECNOLOGÍA AGROPECUARIA
(I. N. T. A.)
CENTRO REGIONAL DEL NOROESTE

ESTACION EXPERIMENTAL AGROPECUARIA DE SALTA

Coronel Moldes, Abril 8 de 1959.-

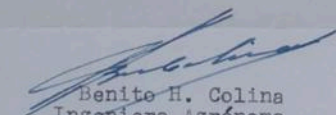
Señor
Director of the Botanical Garden
Thomas Harper Goospeed
University of California
Berkeley- California

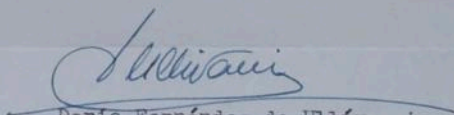
De nuestra consideración:

Tenemos el agrado de dirigirnos a Ud., después de haber leído vuestro libro titulado "The Genus Nicotiana", y muy interesados en el mismo ya que nuestra labor se halla íntimamente vinculada con la fitotecnia de *Nicotiana tabacum*, por lo cual, en conocimiento de que Ud. posee una colección completa del género *Nicotiana*, desearíamos contar con pequeñas muestras de semilla de las diferentes especies que lo componen.

La finalidad que nos persigue es puramente científica con miras a utilizar algunas especies, de comportamiento fértil, en cruzamientos con *Nicotiana tabacum*, y al mismo tiempo poseer dicha colección para observar su comportamiento.

Quedando desde ya muy agradecido por vuestra atención, saludamos a Ud. muy atentamente.


Benito H. Colina
Ingeniero Agrónomo


Darío Fernández de Ullívarri
Ingeniero Agrónomo

Dirección Postal: Estación Experimental Agropecuaria de Salta - Coronel
Moldes - Salta - República Argentina.

saw
Foster ✓
Office ✓ SSG ✓
E. G. ✓ MCTJ ✓
TH ✓
HMW - 2 ✓
PCA - 2 ✓
Allen ✓
Constance ✓
Massou ✓
Stam ✓
Davis ✓
Sprou ✓
Clausen ✓
Evans ✓
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Naumack ✓
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Darlington ✓
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Valbran ✓
Arnts ✓
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Stebbins ✓
Muller ✓
Huxley ✓
Goldsmith ✓
Cuatrecasas ✓
Albarda ✓

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~~Stebbins~~
~~Idler~~
~~Smith III~~
~~Albarda~~

UNIVERSITY OF CALIFORNIA

OFFICE OF THE DIRECTOR
INSTITUTE OF EXPERIMENTAL BIOLOGY
BERKELEY 4, CALIFORNIA

May 10 1955

Dear Dr Goodspeed:

Your Genus Microtharia has
just come to hand - a magnificent summary of
inquiries illumined from many angles.

What a fine example of the
sedulous pursuit of a theme!

Many thanks for your gift of this
beautiful monograph

Sincerely yours

Herbert H. Evans

JOHN SIMON GUGGENHEIM MEMORIAL FOUNDATION
551 FIFTH AVENUE · NEW YORK · N · Y ·

May 31, 1955

Dr. T. H. Goodspeed
University of California
Botanical Garden Expeditions to the Andes
Berkeley 4, California

Dear Dr. Goodspeed:

You are very kind. A copy of your "THE GENUS NICOTIANA: Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics," will be welcomed by the Foundation's Library and by me personally. And no less do I welcome your letter of 26 May. It makes me feel better to read that we have been of some help to your distinguished self in furthering your life's work; for, I have no doubt, yours is a book of classic importance.

My compliments and my respects to you!

Sincerely yours,



Henry Allen Moe

M:s

UNIVERSITY OF MICHIGAN
ANN ARBOR
DEPARTMENT OF BOTANY

June 5, 1955.

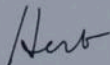
Professor T. Harper Goodspeed
Department of Botany
University of California
Berkeley 4, CALIFORNIA.

Dear Dr. Goodspeed,

"The Genus *Nicotiana*" came yesterday,
and I wish to express my very deep appreciation to
you for your kindness.

It is a magnificent work, and it will,
I am sure, provide a source of great inspiration to
our students of taxonomy and evolution. *Nicotiana*
provided a central core of discussion and study in
our "Evolution and Systematics of Vascular Plants"
course last fall, and now that the finished work is
out the entire study may be seen in panorama.

Sincerely yours,



Warren H. Wagner, Jr.
Assistant Professor of Botany.

Goodspeed, Thomas Harper:

JOHN SIMON GUGGENHEIM MEMORIAL FOUNDATION


acknowledges with thanks the receipt of

The Genus Nicotiana: Origins, Relationships and
Evolution of its Species in the Light of their
Distribution, Morphology and Cytogenetics, by
Thomas H. Goodspeed. Chronica Botanica Company,
Waltham, Massachusetts, 1954, plates, illustrations,

512 pages. June 1, 1955

551 Fifth Avenue
New York City

*Thanks very
sincerely,
again!*


HENRY ALLEN MOE
Secretary General

June 7, 1955

Professor Thomas H. Goodspeed
Department of Botany
Campus

Dear Professor Goodspeed:

I want to express to you my thanks for sending me a copy of your book on the genus *Nicotiana*.

It must be most gratifying to you to see the results of so much labor published in such an attractive and encyclopedic form. May I congratulate you most cordially upon the completion of this important work.

Cordially yours,

Curt Stern

Curt Stern

CS/rr

GEORGE ARENTS
511 FIFTH AVENUE
NEW YORK 17, N.Y.

June 6th
1955

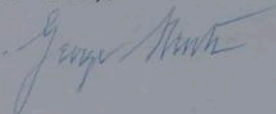
Dr. T. H. Goodspeed,
University of California,
Berkeley 4,
California.

Dear Dr. Goodspeed:

I am delighted to receive
your latest book "The Genus Nicotiana" which
I am sure will be a great addition to my collection.

It has been many years
since I have seen you and as I am eighty
there is very little chance of my visiting
California, so wonder if you will ever be
in New York.

Cordially,



June 16, 1955

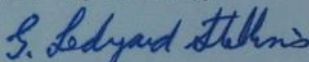
Professor Thomas H. Goodspeed
Department of Botany
University of California
Berkeley 4, California

Dear Professor Goodspeed:

My copy of your very excellent monograph of *Nicotiana* arrived yesterday. I had seen Roy Clausen's copy and was envious of his possession of it. Now I am more than delighted to have my own. It looks like a very complete work and judging from your preliminary treatment it contains a number of most interesting ideas. I shall read it carefully and shall doubtless be asked to review it for at least one Journal. I shall send you copies of any such reviews before they are published.

With many thanks again,

Yours very sincerely,



G. Ledyard Stebbins
Professor of Genetics

GLS:ms

UNIVERSITY OF OXFORD

BOTANY DEPARTMENT

Oxford 57857

3 June 55

Thank you for the beautiful
monograph on Nicotiana.

Kindest regards

Cyril Darlington

R. B. Goldschmidt

590 Arlington Avenue, Berkeley 7, California

June 12, 55.

Dear Harper:

Congratulations to
the final birth of your magnifi-
cent monograph. I actually feel
that you should not have given it
to me as I am in no way competent
in the subject. It is of course a
book for reading. So I turn it over
every single page and read what is
of general interest to the geneeti-
cist and evolutionist. I am impres-
sed with the unbelievable amount
of information it contains and
can hardly believe that you can
keep that without your head bursting.

I am sure that this is the book
on the subject and that it will se-
cure you the credit and admiration
it deserves. I personally would like
you to add one day an old fashioned
"General discussion" in which you as-
semble the general ideas which can
be derived from the overwhelming
body of facts. Again my congratu-
lations and thanks!

I am just up from a
nasty flu with high fever which
ran me down badly. It will take
some weeks to be completely back
again.

Best regards
Yours and
Richard.

THE UNIVERSITY OF MANITOBA

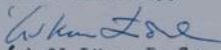
WINNIPEG, CANADA June 2, 1955.

Professor T. H. Goodspeed,
Department of Botany,
University of California,
Berkeley, California.

Dear Dr. Goodspeed:

I cannot let be to write to you to thank you for the pleasure I have had in reading your excellent book on Nicotiana I got a week ago from the Chronica Botanica Company. I have read many papers on modern classification and cytotaxonomy, and I should think no book or paper on cytotaxonomy ever published has been left unread by me for the past fifteen years. However, your book is the best one of them all, and none shows better how much we can do by aid of the methods of cytogenetics and a critical mind. I see on your list of references that you have been writing about Nicotiana for one more year than I am old myself, but I hope you will continue to be in good health for many years to come so that we all can get still more of so good and stimulating works from your pen. When I met you in Stockholm in 1950 (you certainly do not remember all the young fellows you saw there) I enjoyed your presidential address in the experimental taxonomy section as did all the others, but your Nicotiana book gives us thousand times more of stimulating thoughts and teaches us all the methods used by the best of us experimentalists. Thank you once again, and I hope many of those who enjoy the book as much as I do will write to you to tell you how good they feel the work is.

Yours sincerely,


Åskell Löve, D. Sc.,

Associate Professor of Botany.

November 20, 1957

The Ronald Press Company
15 East 26th St.
New York 10, N.Y.

Gentlemen:

I have your bill for \$22.94 for three copies of The Genus Nicotiana ordered by Dr. T. H. Goodspeed at author's rate.

In Dr. Goodspeed's absence in South America I am in charge of his affairs. Before paying this bill I must question the price inasmuch as the author's price until now has been \$6.00 per copy and it was my understanding that all terms under The Chronica Botanica Co. were to remain in effect under your Company.

Will you kindly clarify this matter for me?

Sincerely,

M. Thompson
Secretary

Madrid, November 21. 1955



CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

EL SECRETARIO

Prof. T.H. Goodspeed
University of
CALIFORNIA.

Dear Prof. Goodspeed:

When I returned from my trip to the United States of America I found your book "The Genus Nicotiana", that you were good enough to send me. I beg to thank you most sincerely for this book, which will surely be of very much interest. I shall make it available to the members of the Institute for Soil Science.

Once more, many thanks.

Sincerely yours

José M^e Albareda

Revue Générale de
Botanique, Paris.

Vol 62: No 738-739 - Aug. Sept. 1955
current issue

Pg. 592-3

In this remarkable monograph one finds successively studies of: "d'abord la répartition" in the world of the genus Nic. in America & Australia, "à l'aide" of maps & on the basis of chromosome number of diverse species; then the morphology & anatomy of the genus. In particular, one notices a most thorough study of trichomes, their form & distribution, & the number & form of the chromosomes; of the cytology & mode of reproduction of diverse species represented by 3 beautiful charts.

A great part of the work is devoted to a study in detail of hybrids of Nicotiana
1st generation

& to interspecific relations, to evolution

& lines of the genus Nicotiana
In the latter ^{taxonomic} part, written with the collaboration of H. H. Wheeler & P. L. Hitchcock ^{very detailed} on can read a study of ("très fouillée") of the taxonomy of Nicotiana of which 60 species are successively described & well represented (=drawn?)

This work, very well written & "carefully ~~documented~~" documented, is a model "qui'on souhaiterait posséder ^{pour} pour les principaux genres of plants. It renders a great service to all Botanists.

Ad. Ravy de Virville

⌘

REDUCTION IN 1955-56 PUERTO RICAN ACREAGE ATTRIBUTED TO LOW PRICES PAID TO GROWERS

Trend Towards Less Acreage and Output Is Continued — Commonwealth Legislature Will Convene to Consider Changes in Insular Minimum Wage Act; Seeks to Amend Federal Measure.

(Continued from Page 14)

for tobacco stripping, and 50 cents an hour for the general division which includes cigar manufacturing and the processing of Connecticut leaf. However, as the committee operated under the old law, and the amendments to the Act became effective for Puerto Rico when signed by the President, it will now be necessary to recall all the committees beginning August 29, to go over the same ground once more, a duplication of work, and money spent. Amendments to the FLSA should be made by the next Congress to correct this situation.

As Resident Commissioner Dr. Antonio Fernos Iser said before the U. S. Senate Subcommittee on Labor when the amendments to FLSA were discussed "there is no question that wages should be decent; that they should provide and allow for a respectable standard of living. But we must face the reality that non-existent wages allow for no standard of living at all. We have to be practical. For new industries to venture into Puerto Rico we had to make the sacrifice of temporarily accepting lower wages than we ultimately expect to have.

"When the FLSA was first enacted it was made applicable to Puerto Rico. At 25 cents per hour it played havoc with our needle industry which has to compete with the Philippine industry. The law created widespread unemployment. At the very low wages the needlework industry was paying in Puerto Rico, it still was a wage which kept household together. When the FLSA was extended to Puerto Rico, as in the mainland, it meant to many, no employment, no wages.

"The remedy should have been to exempt Puerto Rico from the application of FLSA of the mainland and leave Puerto Rico to adopt its own Fair Labor Minimum Wage Act, as it subsequently did, and to allow organized labor further to improve wages in Puerto Rico by collective bargaining, as local conditions would permit. A different course was taken. The Federal law was amended to allow Puerto Rico to be exempted from the mainland wage rates, wherever necessary, as found by Industry Committees, created to determine the minimum wage rates to be paid in the island on an industry by industry basis." The situation remains as

before with the industry committee system prevailing after the recent amendments to FLSA.

Lumberton Auctions Show Heavier Volume, Price Rise

LUMBERTON, N. C., Tuesday — Five-cured tobacco sales here last week amounted to 3,739,614 pounds at an average of \$55 per hundredweight, in comparison with the preceding week's 3,593,632 pounds at a \$54.87 average, it was reported yesterday by J. P. Treadaway, sales supervisor of the Lumberton Tobacco Board of Trade.

So far this season, Mr. Treadaway said, Lumberton auctions have disposed of 13,041,834 pounds of leaf at a \$53.71 average, compared with sales of 8,283,956 at an average of \$52.89 per hundredweight in the same number of selling days last year.

Fair Trade Triumphs Again In Department Store Case

BUFFALO, N. Y., Tuesday—Another victory for the cause of fair trade was scored here recently when New York Supreme Court Judge John S. Marsh issued a temporary injunction restraining Sattler's Inc., a local department store, from selling Bulova watches at prices below those set in minimum resale price agreements.

The case involved Sattler's promotion and advertising of close-out prices on watches being sold by the lessee of a department in the store.

New Book Describes Origin, Evolution of Tobacco Plant

WALTHAM, MASS., Tuesday—The publication of a new book, "The Genus Nicotiana," written by Professor Thomas H. Goodspeed of the University of California, was reported today by The Cronica Botanica Co., of this city, and Stecher-Hafner, Inc., of New York, publishers.

The new volume, totaling 558 pages with illustrations, deals in exhaustive detail with the origin, relationships and evolution of the species of tobacco plants in the light of their distribution, morphology and cytogenetics. The book's cost is \$12.50.

Reynolds Metals Co. Plans To Buy Into Quebec Firm

RICHMOND, VA., Tuesday — The Reynolds Metals Co. is presently negotiating for the acquisition of a controlling interest in Aluminum Rolling Mills, Ltd., Cap de la Madeleine, Quebec, it was revealed. Details will be announced later.

The proposed acquisition would give the Reynolds company its first fabricating facilities in Canada. Aluminum Rolling Mills produces aluminum foil for packaging and other purposes, it was reported.

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AGRONOMY JOURNAL
BOOK REVIEWS
JULY, 1955

THE GENUS NICOTIANA. ORIGINS, RELATIONSHIPS
AND EVOLUTION OF ITS SPECIES IN THE LIGHT OF
THEIR DISTRIBUTION, MORPHOLOGY
AND CYTOGENETICS

By Thomas Harper Goodspeed. *Chronica Botanica*, New York,
Steckert-Hafner, xxii + 536 pages, 118 plates and illus.
1954. \$12.50.

This book is a monographic study made over a period of nearly 50 years of the 60 species of *Nicotiana*. It is unique in that the author has made many observations on living plants of 56 of the species rather than on herbarium specimens. He has also had access to all herbarium materials. Parts I-V deal with their morphology, cytology, geographic distribution, and phylogeny. The chromosome behavior of over 200 F₁ interspecific hybrids is analyzed. Part VI, done in collaboration with H.M. Wheeler and P. C. Hutchison, treats of the taxonomy of each species. Each is illustrated with line drawings. There are keys to the subgenera, sections, and species.

The mass of data assembled in this book makes it especially valuable to the geneticist, agronomist, and plant pathologist. Since some species of *Nicotiana* are resistant to specific diseases, its concepts are of practical importance for use to improve quality and resistance to diseases in cultivated kinds of tobacco.—F. A. Wolf.

Diplomkolonialwirt
HELMUTH ASCHENBRENNER

Generalsekretär der
Internationalen Tabakwissenschaftlichen
Gesellschaft

~~HEIMEN LANGEHAUSE 116~~

Köln-Lindenthal, Hans Sachs Str. 21

mit den

Goodspeed, Thomas Harper, 1887-

The genus *Nicotiana*; origins, relationships, and evolution of its species in the light of their distribution, morphology, and cytogenetics. Waltham, Mass., Chronica Botanica Co., 1954.

xxi, 536 p. illus., maps. 25 cm. (Chronica botanica, v. 16, no. 1/6)

Bibliography: p. 495-512.

CONTENTS.—Distribution, morphology, cytology of species; cytology of F₁ interspecific hybrids; phylesis, by T. H. Goodspeed.—Taxonomy, by T. H. Goodspeed, H.-M. Wheeler, and P. C. Hutchison.

1. Tobacco. 1. Title. (Series)

QK1.C55 vol. 16, no. 1/6 583.79 54-12802
Copy 2. QK495.N5G5

Library of Congress

(7)

Goodspeed, Thomas Harper, 1887-

The genus *Nicotiana*; origins, relationships, and evolution of its species in the light of their distribution, morphology, and cytogenetics. Waltham, Mass., Chronica Botanica Co., 1954.

xxi, 536 p. illus., maps. 25 cm. (Chronica botanica, v. 16, no. 1/6)

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1. Tobacco. 1. Title. (Series)

QK1.C55 vol. 16, no. 1/6 583.79 54-12802
Copy 2. QK495.N5G5

Library of Congress

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THE SEARCH FOR NICOTIANA

MIDI

T. HARPER GOODSPEED: *Plant Hunters in the Andes*. Hale. 21s.

ALAN BURGESS: "

The main quarry of *Plant Hunters in the Andes* is the tobacco plant, and Mr. Goodspeed's book is the second recent example of a botanist's life-long absorption in the study of a plant of widespread human consumption whose history began in the Andes. Mr. Goodspeed's devotion to the tobacco plant is not as deep nor as severely exclusive as Dr. Salaman's devotion to the potato. This volume, though it is large and opulent, rivals Dr. Salaman's formidable treatise only in the sense that it assembles material from which nicotiana may ultimately be treated as exhaustively as Dr. Salaman has treated solanum.

Mr. Goodspeed's 30-year study of the growth of nicotiana varieties in the Botanical Gardens of the University of California induced him to lead a major investigation of the distribution of its wild species in two South American expeditions during 1935-36 and 1938-39. It was suspected that nicotiana occurs on both slopes of the Andean chain all the way from Peru to Patagonia. The map of these operations shows a formidably extended network which was covered, with comparatively few workers in the field, by throwing out search-parties so arranged as to overtake the plant at its flowering and seeding period wherever it was guessed to be lurking. But though these sorties were fired with a passion for a particular genus of plant, the workers had other commissions to fulfil and, failing that, themselves as individual botanists to please. In general the orders were:— nicotiana if you can, and anything else that interests you if you cannot. The resultant mixed bag, though not as rich in tobacco content as Mr. Goodspeed hoped, was quite large enough for him to handle. He shows that if the collectors' aim is more than the furnishing of herbaria, the seizure of plants is only half his battle. Hard professional labour at the base and all the resources of modern transport are necessary to get them out to their place of exile with a good chance of survival and reproduction.

For the general reader Mr. Goodspeed's narrative, with its great wealth of photographs, is in superficial effect a mammoth flower show. But beneath the flowers are the continental rock formations which cranny them, and dispersed within the natural architecture are the mysteriously shaped and piled stones of the Incas, the cities of the Spaniards, the Indian village settlements and the engineering projects which are now attacking the mountainous wilderness with a new ferocity. Occasionally in these pages the immense scene is lit by a ray which could only have proceeded from the imaginative insight of a botanist. In northern Peru, where the Andes fall giddily towards the Amazon, the earth's surface rises four miles

through a steep temperature gradient in so short a horizontal distance that it is possible to stand with Mr. Goodspeed and see, spread in successive layers from snow-line to gorge bottom, all the main zones of global vegetation. And if flowering weeds are not of supreme interest one can mark the hazards and hardships of those who, when automobiles even of the crazy Andean variety have been left behind, will stick at nothing to get them. *Nicotiana cordifolia* on Juan Fernandez, a fuchsia in a Peruvian gorge, and alpine nasturtiums on a slope of moving scree in the shadow of Aconcagua had all to be paid for in this coin, and before the venture came to an end the Chilean earthquake of January, 1939, had also presented its account.

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Berkeley 4, California
October 13, 1955

The Times
Editor, Literary Supplement
London, England

Dear Sir:

In the issue of July 14, 1950 of the Literary Supplement a notice of my "Plant Hunters in the Andes" appeared. The following is a quotation from it:

"Mr. Goodspeed's devotion to the tobacco plant is not as deep nor as severely exclusive as Dr. Salaman's devotion to the potato. This volume, though it is large and opulent, rivals Dr. Salaman's formidable treatise only in the sense that it assembles material from which nicotiana may ultimately be treated as exhaustively as Dr. Salaman has treated solanum."

The products of my South American plant hunting plus research on the wild relatives of the tobacco plant covering a period of 40 years have recently been assembled in a volume entitled "The Genus Nicotiana" a copy of which my publisher tells me he has sent to you.

I cannot say that I have treated of tobacco as exhaustively as Dr. Salaman treated of the potato. Indeed, my book has relatively little to say about *Nicotiana tabacum*. On the other hand, it represents an attempt to picture the origins, evolution and current relationships of all the known species of a characteristic genus of flowering plants on the basis of a variety of evidence.

However, up to a point my book does fulfill the prediction contained in the above quotation.

Sincerely,

THG:T

The Genus *Nicotiana*. THOMAS H. GOODSPEED. 536 pgs., 118 plates. Chronica Botanica Co., Waltham, Mass. and Stechert-Hafner, Inc., New York, N.Y. (1955) \$12.50.

This comprehensive volume is the result of fifty years of study at the University of California Botanical Garden on one genus, *Nicotiana*. Fifty-six of the sixty species recognized, as well as many varieties, were grown and hybridized. This live collection permitted studies of comparative morphology and cytology, the results of which confirmed many of the author's phyletic hypotheses. The present distribution of all species of the genus is mapped and interpreted in the light of the geologic history of the Americas, Antarctica and Australasia. A complete evolutionary picture in charts shows the derivation of each of the sixty species. *AI DS Bull. 5²⁵ p11 Oct '55*

BOOK REVIEW . . . The Genus *Nicotiana* by T. H. Goodspeed (Professor of Botany and Director of the Botanical Garden, University of California, Berkeley). Published by The Chronica Botanica Co., Waltham 54, Mass.

Dr. Goodspeed's book is a report of extensive research on the Origins, Relationships and Evolution of the Genus *Nicotiana* in the light of their distribution, morphology and cytogenetics.

Amplifying discussion of comparative morphology are full page illustrations representing distinctions in leaf type, inflorescence types and their derivation, and the various trichome types.

In the section on cytology, karyotypes of all but four of sixty recognized species and complete meiotic sequences in representative species and hybrids are illustrated.

The completed evolutionary picture is presented in charts showing the derivation of each of the sixty species.

Part VI of this book is a taxonomic reorganization of the genus reflecting the relationships demonstrated in previous chapters.

This excellent scientific work is highly technical in format and a highly recommended reference for anyone interested in Plant Science and/or in tobacco genetics.

The Genus *Nicotiana* is published and available from the Chronica Botanica Company, Waltham, Mass. and from Stechert-Hafner, Inc., NYC. The book is 536 pages, contains 50 tables and 118 illustrations. Bound in buckram is priced at \$12.50 per copy.

The Tobacco Record

d

are now about to raise plants with and without various macro- and micro-nutritive substances and hormones. Sand culture technique and the maintenance of field logs are other subjects included in this handbook.

Analysis of Soils and Plants for Foresters and Horticulturists. S. A. WILDE and G. K. VOIGT. 117 pgs. J. W. Edwards, Publishers, Ann Arbor, Mich. (1955) \$3.75.

Most research in soils has been confined, until recently, to soils supporting annual crops. This small book discusses the subject in terms of perennial crops, such as forests, orchards and nurseries. Chapters include: Analysis of Physical Properties of Soils; Analysis of Chemical Characteristics of Soils; Analysis of Ground Water; Analysis of Biological and Microbiological Properties of Soils, Organic Residues and Composts; Floristic and Mensuration Analyses; Analysis of Plant Tissue; and Analysis of Nursery Stock.

Cotton Growing Problems. B. G. CHRISTIDIS and G. J. HARRISON. 633 pgs., 161 figs. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N.Y. (1955) \$9.75.

Any student of cotton growing anywhere in the world can turn to this new book for answers to his problems. Seldom has a reference book been written with such breadth. The underlying principles of most problems and the experimental evidence for new cultural methods are two large areas of discussion. Topics covered for the first time in such a text include modern insecticides, irrigation practices, chemical weed control, chemical defoliation, and mechanical harvesting. Liberal use has been made of world-wide research results.

The Genus *Nicotiana*. THOMAS H. GOODSPEED. 536 pgs., 118 plates. Chronica Botanica Co., Waltham, Mass. and Stechert-Hafner, Inc., New York, N.Y. (1955) \$12.50.

This comprehensive volume is the result of fifty years of study at the University of California Botanical Garden on one genus, *Nicotiana*. Fifty-six of the sixty species recognized, as well as many varieties, were grown and hybridized. This live collection permitted studies of comparative morphology and cytology, the results of which confirmed many of the author's phyletic hypotheses. The present distribution of all species of the genus is mapped and interpreted in the light of the geologic history of the Americas, Antarctica and Australasia. A complete evolutionary picture in charts shows the derivation of each of the sixty species.

Forestry Handbook. Edited by REGINALD D. FORBES. 1220 pgs., 744 illus. Ronald Press Company, 15 East 26th St., New York 10, N.Y. (1955) \$15.00.

Forestry Handbook should immediately take its place on the scientific reference shelf with the *Handbook of Chemistry and Physics*. To the thousands of persons engaged in forestry and forest products industries, this book is a must. It contains the working methods and techniques, formulas, tables, converting factors and related data most commonly used. In addition information about watershed management, forest recreation, wildlife management and forest range management is supplied. Six years in preparation, an editorial board of 145 supplied guidance and material to the Society of American Foresters, under whose auspices the Handbook was prepared.

Forestry and Related Research in North America. FRANK H. KAUFERT and WM. H. CUMMINGS. 280 pgs. Society of American Foresters, Mills Bldg., Washington 6, D.C. (1955) \$5.00.

This is the report of a study conducted by the Society of American Foresters under a grant from the Rockefeller Foundation. The study had as its objectives, (1) reviewing the progress in forestry and related research in North America during the past quarter century, (2) determining the present status of research by all agencies, (3) assessing the adequacy

from one place to another." He concludes further that man of today is childish, does not know how to use his mind, or how to develop his character, solve his problems, or train his children. The book has considerable value for use in self-analysis.

The Genus Nicotiana. By THOMAS HARPER GOODSPEED. The Chronica Botanica Co., Waltham, Massachusetts, and Stechert-Hafner, Inc., New York. Pp. 536, figs. 118. Price \$12.50.

This is volume 16 of Chronica Botanica, which is a collection of studies in method and history of biology and agriculture under the editorship of Frans Verdoorn. The author is director of the botanical garden, University of California, Berkeley. Parts I-V deal with distribution, morphology, and cytology of species and F interspecific hybrids, and with phyletic. For part VI, on taxonomy, the author had the assistance of H. M. Wheeler and P. C. Hutchison. The distribution and evolutionary development of the several species in the Americas, Antarctica, and Australia are traced and illustrated. It is particularly interesting to note that a living collection of 56 of the 60 known species and varieties are now growing in the botanical garden at Berkeley. The appendix contains a list of herbaria cited, description of the genus, key to subgenera and sections, and descriptions of subgeneric categories, with keys to species and varieties. Reference is made to the publications of some 200 authors. This is an exceptionally fine presentation of the subject.

Grassland Farming. By GEORGE H. SERVISS AND GILBERT H. AHLGREN. John Wiley and Sons, Inc., New York, 1955. Pp. 146, figs. 48. Price \$2.96.

The authors have developed a concise statement concerning grassland farming and the practices related thereto for agricultural students in high schools and junior colleges. A few references and a list of questions are appended to each chapter. Three plates in color show potash deficiency, good and poor silage, and spittlebugs on alfalfa.

Handbook of Food and Agriculture. Edited by FRED C. BLANCK. Reinhold Publishing Company, New York, 1955. Pp. 1039. Price \$12.50.

The 26 chapters contained in this large volume cover a wide range of subjects, starting with the soil and ending with the food, drug, and cosmetic act. Soil-plant scientists will find of special interest the chapters on "Soils" by Eric Winters, "Soil Fertility" by C. L. W. Swanson, "Soil Microbiology" by Charles Thom, and "Fertilizers" by A. L. Mehring. And they will find many points of interest in the discussions on pesticides; growth regulants; enzymes; rancidity; essential nutrients; the storage, preservation, canning, and spoilage of foods; the cereal, dairy, vegetable oil, animal, and poultry products; seafoods; plant chemistry; the engineering, packaging, and quality control of foods; disposal of wastes; and chemicals in food. The appendix contains the food laws and information on nutrition, special food agencies, research groups, food literature, and plant sanitation. The editor, who has been associated at various times with the U. S. Depart-

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SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
WASHINGTON 25, D. C.

8 November 1955

Prof. Th. H. Goodspeed
Dept. of Botany
University of California
Berkeley

Dear Hayer:

I have just received your splendid book for which I thank you very much and I congratulate you cordially.

It is a great piece of work and a lot of planning in it, accuracy in every detail and intelligent interpretation. The first impression can not be better. I intend to study it and to publish a review in the Bulletin of Science and Tech. of the Panamerican Union.

I thank you too, for having included my humble name within the persons you are "particularly in debt"

With best regards

very cordially yours
Loré

Raznoëksport, Vsesoïuznoe ob'edinenie.

Soviet tobaccos. Moscow 194-?

127 p. (chiefly illus.) 30 cm.

1. Tobacco—Russia. 1. Title.

SB278.R9R3

633.71

56-16342 †

Library of Congress

3

2948

March 1956

Durch Reisen nach Südamerika wurde die Nicotianasammlung auf 60 Arten gebracht, die mit geringen Ausnahmen in Berkeley kultiviert und am lebenden Objekt studiert werden konnten. Die Untersuchungen erstreckten sich auf pflanzengeographische, morphologische und cytologische Probleme. Das 5. Kapitel bringt sodann die Interpretation der erarbeiteten Einzelkenntnisse vom Standpunkt der phylogenetischen Entwicklung. Der Schlußabschnitt enthält gewissermaßen das praktische Ergebnis der ganzen Arbeit in Gestalt einer Reorganisation der Nicotianasystematik, bei der außer dem Hauptverfasser noch die Botaniker H. M. Wheeler und P. C. Hutchinson mitgearbeitet haben. Dieser Teil enthält ganzseitige Abbildungen von 60 auch im Text genau beschriebenen Nicotianaarten. Auch sonst enthält das Buch zahlreiche Tafeln und Tabellen. Der agronomische Standpunkt bleibt unberücksichtigt, doch finden sich bei den einzelnen Species gelegentlich Angaben über Kultivierung mit ethnologischen und historischen Hinweisen.

Tabak — botanisch gesehen

Goodspeed, Thomas Harper: *The genus Nicotiana: origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics.* — Waltham, Mass.: Chronica Botanica Company 1954. XXI, 536 S. (Chronica botanica vol. 16, no. 1/6). Preis \$ 12.50.

Die weltbekannte und wirtschaftlich ungemein wichtige Gattung Nicotiana hat hier eine vom botanischen Standpunkt schlechthin erschöpfende Behandlung erfahren. Seit 1904 werden im Botanischen Garten der Universität von Kalifornien (Berkeley, Cal.) umfassende Nicotiana-Studien durchgeführt, deren Ergebnisse nun vom Direktor des Gartens veröffentlicht wurden.

Exleg-Ausschnitt
BIS
SCHRIFTUM DER BODENKULTUR
Band 7, Hft 3/4
(..... 1947)

From *Ciencia y Tecnología*
Rev. Acad. Indígena

vol 5, # 8, July - Sept 1965

NOTAS BIBLIOGRAFICAS

Goodspeed, Thomas Harper: *The Genus Nicotiana*, Waltham, Massachusetts, U. S. A., "The Chronica Botanica Co." and New York City, U. S. A.: "Stechert-Hafner Inc.", 1954, XXII-536 pp., 118 figuras e ilustraciones, u\$s 12. 50.

Esta obra maestra del catedrático de Botánica y director del Jardín Botánico de la Universidad de California, (Berkeley, California, U. S. A.) forma el volumen 16 de "Chronica Botanica". Consta de seis partes. Las cuatro primeras forman la base de una interpretación (que se desarrolla en la quinta) de los orígenes, relaciones y evolución del género nicotiana (el tabaco). La Parte VI presenta una reorganización taxonómica de esta importantísima planta, con claves de los sub-géneros y descripciones de todas las categorías incluidas en el género.

Durante más de treinta años, el autor se ha dedicado a investigaciones de la planta nicotiana, por medio de exploraciones, experimentos de cultivo de varias especies, y estudios en la distribución, morfología y citología de la planta, logrando reunir una colección de plantas vivas de 56 de las 60 especies reconocidas, la cual hizo posible estudios muy extensos sobre la morfología y citología del género, y experimentos en la hibridación de las varias especies. Ahora, en este libro, cumbre de sus trabajos, ofrece al mundo científico todos los resultados de estas investigaciones en una forma que seguramente servirá como obra básica por largos años en el futuro.

En la parte primera de la obra hay un resumen de la distribución (actual y prehistórica) de nicotiana en el mundo: en América del Sur, en Norteamérica, en Australia y en el Sud-Pacífico. Mapas bien detallados acompañan los cuatro capítulos de esta sección. Esta parte ha de tener gran interés no solamente para los estudiantes de la fitogeografía y la historia de la distribución de las plantas, sino también para todos los que se interesan en la historia geológica de las regiones del mundo donde la nicotiana es planta indígena. Para los lectores de *Ciencia y Tecnología*, los capítulos 3 y 4, sobre la distribución de nicotiana en América del Sur y en Norteamérica tendrán especial importancia porque el Dr. Goodspeed presenta sus teorías sobre la distribución de nicotiana, bien apoyadas con datos detallados de la historia geológica de gran parte del Nuevo Mundo.

La segunda sección presenta informes sobre la morfología y anatomía de nicotiana, y la tercera, una de las más importantes secciones del libro, trata de su citología. Aquí se consideran los

números de las cromosomas, la citología de la reproducción de la planta, la citología de los híbridos, y estudios en euploidia, aneuploidia y amphiploidia. La parte cuarta ahonda más en la citología de los híbridos inter-específicos. En la quinta, el Dr. Goodspeed ofrece sus teorías de la evolución del género: por medio de amphiploidia, hibridación, introgressión y reorganización de los cromosomas.

En la última sección hay descripciones de más de 60 especies y variedades del género nicotiana. En esta parte el autor reconoce la colaboración de la Dra. Helen-Mar Wheeler y del Dr. Paul C. Hutchison. Las ilustraciones (hay un dibujo para cada especie y variedad), demuestran muy claramente todas las diferencias de importancia en la morfología de la planta. También hay ilustraciones de todos los cariotipos, con la excepción de cuatro especies. La evolución entera del género se presenta en diagramas, en las cuales se incluye la derivación de cada una de las 60 especies. Completa el libro una bibliografía muy extensa de todos los trabajos citados.

Como se ve por este resumen, la obra del Dr. Goodspeed debe ser incluida en todas las bibliotecas científicas que se especializan en la historia natural, particularmente en la botánica. Servirá como obra de consulta para los estudiantes en todas las ramas de la botánica, tanto como para los que se dedican a estudios de la genética, citología, fitogeografía, etnobotánica, etc.

Dra. Ida K. Langman
Academy of Natural Science of Philadelphia
Philadelphia, Pennsylvania, U.S.A.

Hall, Thomas S. and Moog, Florence: *Life Science*, New York, U. S. A., John Wiley and Sons, Inc., 1955, X-502 pp., 411 fig., u\$s 6. 50.

Los autores, ambos profesores universitarios de Washington, especializados en Zoología, son muy conocidos entre los biólogos. Y si esto no fuera garantía bastante para leer este libro, ellos mismos nos dicen en el prólogo que los distintos capítulos han sido sometidos a la revisión y crítica de biólogos especializados en la respectiva materia. El libro viene anunciado como de texto para el "College" americano; esto es, para la formación de una cultura superior. En los once capítulos de que consta se trata de la vida celular, de las plantas, de los vertebrados e invertebrados, reproducción, origen de las especies y el organismo frente al medio. Es tanta la cantidad y tal la calidad de las ilustraciones, con esquemas, grabados, fotos y

Book Reviews

The Diseases of Occupations. Donald Hunter. Little, Brown, Boston, 1955. vii + 1046 pp. Illus. \$20.

Occupational medicine is the division of the health sciences that seeks to bridge two great technologies: modern industry and modern clinical medicine. Within this broad domain there is room for authoritative textbooks that cover different segments or present different approaches to specific segments of the whole. The present book deals with the disease processes known to be caused by factors of occupation, and does so in an interesting fashion.

An especially delightful feature of the book is a generous presentation of non-clinical information, which serves as the background and general framework for the description of occupational diseases. The story of the industrialization of society and of the full meaning of this for the English worker is accomplished with enviable brevity and clarity. A rather large proportion of the total text is given over to descriptions of the industrial processes at which harmful exposures may occur. These are in terms that are useful to the clinician, and they suggest wide, firsthand acquaintance with these matters on the part of the author.

Those who are especially experienced in one or another occupational disease may find some fault in the location of emphasis, in certain omissions, and in a failure here and there to recognize the clinical variations of dynamic disease processes. In this country where the present compulsion is to define safe exposures in terms of dose as the product of time and concentration to the end that precise engineering specifications may be developed for the elimination of hazards, there may be some grumbling that numbers are loosely handled. In short, this is not a technical handbook. Rather, it is a full and exciting presentation of a branch of medicine that has until recently been grossly neglected and must be developed more fully if we are to live successfully with an ever-increasing industrialization.

The book provides a much needed framework for both the teacher and the student of occupational medicine. The practitioner who occasionally wonders

about the relationships between employment and the clinical problem at hand will find here a positive stimulus to consider occupational diseases, but he will not always find help in distinguishing these from nonoccupational conditions. For the specialist in occupational medicine, the book will provide a rich filling-out of his personal experience and will prove to be a difficult volume to put aside once it is opened.

ADOLPH G. KAMMER
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University of Pittsburgh

The Genus *Nicotiana*. Origins, relationships, and evolution of its species in the light of their distribution, morphology, and cytogenetics. Thomas Harper Goodspeed. *Chronica Botanica*, Waltham, Mass.; Stechert-Hafner, New York, 1954. xxii + 356 pp. Illus. + plates. \$12.50.

Thomas Goodspeed's studies of *Nicotiana* began soon after a research program on the genus was initiated at the University of California in 1904. His investigations during the past 30 years have been directed toward an accumulation and analysis of evidence on the origins, evolution, and relationships of the modern species of the genus. A feature of the studies has been the maintenance of a living collection of almost all the *Nicotiana* species and the production of a large number of different interspecific hybrids. Both species and hybrids have been studied comprehensively from chromosomes to trichomes.

In the first chapter of Goodspeed's book the objective and argument are presented. Then follow 11 chapters that document in detail the evidence from geographic distribution, morphology, cytology of the species, and cytology of F_1 interspecific hybrids in terms of the nature and significance of chromosome-pairing relationships at meiosis.

The main theoretical concepts on *Nicotiana* evolution, past and present, are set forth in Chapters 13 and 14 under the collective heading "Phytilesis." The author's views on the evolutionary background of the genus and the cytological

mechanisms involved in the formation of 12- and 24-paired modern species are plausible and convincing, respectively. Speculations on the future of the genus are conservative, ending on the optimistic note that "the genus may be expected to expand both genetically and geographically, with greatest increase in number of species on the higher polyploid level."

The final part of the book is a 170-page taxonomic monograph of the genus, which was prepared in collaboration with Helen-Mar Wheeler and Paul C. Hutchinson, senior botanists at the University of California Botanical Garden. This new and complete systematic treatment will be invaluable to those working with the genus, for in the past there has been much confusion owing to synonymy, names from insufficiently known specimens, and so forth.

Diagrammatic representations of the evolution of *Nicotiana* species in terms of three arcs culminating at the third level, in the current 14 sections and 60 species are highly effective. By repetition there is perhaps a tendency to overemphasize the hypothesis that the genus arose from a pregeneric reservoir consisting of 6-paired pre-*Cestrum*, pre-*Nicotiana* and pre-*Petunia* elements. For a broader genetic exposition of the relationships among species, the author could have included to advantage discussion of such significant subjects as duplicate genes and genetic analysis of generations succeeding the F_1 of interspecific hybrids. A more detailed treatment of the cultivated species, *N. tabacum*, would, in my opinion, have further increased the general usefulness of the book for reference.

The Genus Nicotiana is a much needed and welcome compilation of a wealth of world literature and a lifetime of research. It will take its place among such classics as Babcock's *The Genus Crepis* and *The Evolution of Gossypium* by Hutchinson, Silow, and Stephens. Finally, admirable publishing skill is exhibited in the numerous excellent illustrations and pleasing format of the book.

HAROLD H. SMITH
Brookhaven National Laboratory
and Cornell University

The Interpretation of Dreams. Sigmund Freud. Translated by James Strachey. Basic Books, New York, 1955. xxxii + 692 pp. \$7.50.

This edition is a reprint of volumes IV and V, the first to appear (in 1953) of the Standard Edition of the Complete Psychological Works of Sigmund Freud now being published under the auspices of the British Institute of Psychoanalysis.

The Interpretation of Dreams was regarded by Freud as his most important

- L. 691¹⁰. — G. LAWRENCE. — INTRODUCTION TO PLANT TAXONOMY. (Introduction à la taxonomie des plantes). — Macmillan C^o, New-York, éd., 1955. — Un vol., 179 p., 69 fig. (In-8/11.501).
Classification des plantes. Evolution et unités de classification. Structure des plantes. Techniques de la collection et de l'identification. Nomenclature. Phylogénie et biosystématique. Taxonomie dans l'Amérique du Nord. Familles importantes et leurs caractères.
- L. 692¹⁰. — T. H. GOODSPEED. — THE GENUS NICOTIANA. ORIGINS, RELATIONSHIPS AND EVOLUTION OF ITS SPECIES IN THE LIGHT OF THEIR DISTRIBUTION, MORPHOLOGY AND CYTOGENETICS. (Le genre Nicotiana. Origines, parentés et évolution de ses espèces, des points de vue de leur distribution, morphologie et cytogénétique). — Chronica Botanica C^o, Waltham (U.S.A.), 5d., 1954. Distr. en France: P. Raymann, Paris (6). Coll. « Chronica Botanica, Serial Studies, vol. 16, n. 1/6 ». — Un vol., 536 p., 118 pl. h. t. et ill., 50 tabl. — Prix: \$ 12.50. (In-8/11.206).
I. Distribution: World distribution: South America, North America, Australia and the south Pacific distribution. — II. Morphology: General morphology; anatomy and trichomes. — III. Cytology of species: chromosome number and morphology; cytology of reproduction; euploidy, aneuploidy and amphiploidy. — IV. Cytology of F₁ interspecific Hybrids: categories of pairing and meiotic sequences; nature and significance of MI Behavior. — V. Phytosis: species origins, relationships and evolution; the future of the Genus. — VI. Taxonomy of Nicotiana: historical Résumé; description of Genus; Key to Subgenera and Sections; descriptions of subgeneric categories with keys to species and varieties; Subgenera rustica, Tabacum and Petunoides; Insufficiently known.
- L. 693¹⁰. — H. GAMS. — KLEINE KRYPTOGAMENFLORA VON MITTELEUROPA. IIb. BASIDIOMYCETEN II. Teil. M. MOSER. — DIE RÖHRLINGE, BLÄTTER-UND BAUCHPILZE. (Petits cryptogames de l'Europe Centrale. IIb. Basidiomycètes - II^e Partie: Agaricales et gastromycètes). — G. Fischer, Stuttgart (All.), éd., 1955. 2^e éd. — Un vol., 327 p., 17 fig. — Prix: D.M. 16.50. (In-8/8.236 - II).
Revue de douze familles de champignons. (V. nos précédentes analyses: L. 52¹² et L. 374¹⁴).
- L. 694¹⁰. — J. McLUCKIE et H. S. McKEE. — AUSTRALIAN AND NEW ZEALAND BOTANY. (Botanique d'Australie et de Nouvelle-Zélande). — Associated General Publications, Sydney (Austr.), éd., 1955. — Un vol., 758 p., 276 fig. — Prix: 84/ (In-8/11.403).
Ouvrage surtout destiné aux élèves des Universités d'Australie et de Nouvelle-Zélande, et comprenant trois parties: I. Généralités sur la chimie et la constitution des plantes; les phénomènes de diffusion, d'osmose, d'absorption, transpiration, photosynthèse, respiration; la croissance, les vitamines et enzymes. — II. Classification du règne végétal; évolution des plantes; champignons, bactéries et virus; angiospermes hétérotrophiques. — III. Nomenclature et classification des plantes à fleurs; hérédité; paléobotanique; variation et évolution; écologie et géographie des plantes. Flore australienne et new-zélandaise. — Progrès de la botanique australienne.
- L. 695¹⁰. — M. H. MULBERGER et K. BERTSCH. — ALPENBLUMEN. (Fleurs des Alpes). — Otto Maier, Ravensburg (All.), éd., 1954. — Deux vol.: I. Atlas, 21 tabl. et 141 ill. col. II. Texte: 35 p. — Prix: D.M. 7.80. (In-8/11.412).
Très bel atlas, reproduisant dans ses coloris la flore de la montagne et constituant avec le texte explicatif qui l'accompagne, le guide idéal de l'amateur de la nature et de ses fleurs.
- L. 696¹⁰. — ANNE ASHBERRY. — MINIATURE FLOWERS AND VASES. (Fleurs et vases miniature). — G. A. Pearson, Londres, éd., 1955. — Un vol., 190 p., 129 pl. h. t. — Prix: 15/ (In-8/11.466).
Album de plantes et vases minuscules portant la marque d'un goût délicat, accompagné de commentaires explicatifs sur l'harmonie et les coloris, les époques de floraison, les noms des plantes, les roses et les vases miniature, les fleurs séchées.

Extract from
South African Journal
 of Science

Suid-Afrikaanse
 Joernaal van Wetenskap

PUBLISHED BY THE SOUTH AFRICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

UITGELEVERD DOOR DIE SUID-AFRIKAANSE VERENIGING VAN WETENSKAP

Date - SEP 1955

BOTANY

2485
 THE GENUS *NICOTIANA*, by T. H. GOODSPEED, *Waltham, Mass., U.S.A. Chronica Botanica Co., (Cape Town, Juta & Co.) 1954. 512 pp., illus. Price \$12.50.*

The reasons which have caused biologists to concentrate on the study of particular organisms are mainly (1) technical and (2) economic. *Drosophila*, the guinea-pig, *Neurospora* and *Chlorella* are examples in the first category; maize and man are examples of the second. That the genus *Nicotiana* should claim a 500-page volume at this stage in the development of botany reflects the importance of the tobacco plant in human economy.

Professor Goodspeed has collected and grown in California all but four of the sixty known species of *Nicotiana*. This unique collection has made possible the extensive study of the genus, particularly in connection with cytogenetics and interspecific hybridization, recorded in this volume.

Unfortunately the author does not deal with "such problems as the extent to which indigenous or introduced species . . . were snuffed, smoked or otherwise employed as narcotics by early man in the Americas and elsewhere or the ethnological and other implications of such use in terms of human migrations or cultural levels," though references are given to researches on these topics by other workers.

The large preponderance of 12-paired (chromosome) species in S. America points to that continent as the place of origin of the genus. From there migration must have occurred to N. America and Australia. Absence of 12-paired species in Australia suggests that the immediate progenitors were established by amphidiploidy in S. America previous to their migration to Australia. The two 24-paired species in Australia (both found on the east coast) probably represent descendants of the original migrants.

Migration from S. America to Australia is believed to have occurred via Antarctica when temperate conditions prevailed there. The fact that certain species of *Nicotiana* are used by the Australian aborigines for their narcotic properties, might tempt romantic anthropologists to find evidence here of human migration across the Pacific in prehistoric times, but the degree of speciation the genus has undergone in Australia points to a time of migration long prior to the advent of man.

In a short chapter the author has attempted to predict the future of the genus "on the basis of the various mechanisms shown to have been concerned in its evolution and the extent to which each has apparently contributed to speciation in the past." Certain other postulates are made, including the assumption that an interglacial period is now in its early phases and that man, by disturbing the soil of the planet will continue to create new types of habitats in which the plant will flourish.

In view of the fact that it was its alkaloidal content that first attracted man's attention to *Nicotiana*, and that improvement in the smoking qualities of the leaf has been the *raison d'être* of most tobacco-breeding experiments, it is amazing that there is no reference to these matters in this book nor any mention of nicotine in the index.

E.R.R.

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GOODSPEED, T. H.
The genus *Nicotiana*. *Pl. Breeding Abstracts*
Chronica Botanica Co., Waltham, Mass.,
USA 1954 : 16 : No. 1/6 : \$12.50 : Pp. xxi
+ 536 : 118 figs.

Some of the most valuable contributions to biology in recent years, and not to biology alone, have been combined taxonomic and cytogenetical investigations of single genera. The study of *Gossypium* by J. B. Hutchinson, R. A. Silow and S. G. Stephens, the main results of which were published in "The evolution of *Gossypium*" (cf. *PBA*, Vol. XVIII, p. 183), is a case in point. *Nicotiana* is another genus which has been the subject of comparable detailed taxonomic and cytological investigation, in particular at the University of California where work on the genus was begun by the late W. A. Setchell in 1904 and continued especially by the present author and R. E. Clausen. Summaries of a long series of papers on the genus by the last two authors appear in past issues of *Plant Breeding Abstracts*.

The present volume integrates the results published hitherto and includes much new material. The first part deals with the geographical distribution of the species and the interpretation of this in terms of geological history. The second part is a review of the range in morphology encountered in the genus; one of the most important chapters in this part is Chapter 7 in which the significance of trichome variation is discussed. In part III, the cytology of the species is described, with the principal emphasis on chromosome numbers and caryotype analysis. Part IV is perhaps the most important of all since it deals with the cytology of over 200 interspecific hybrids, representing all the major types encountered in the genus. It is principally on the basis of the metaphase configurations encountered in these hybrids, together with the morphological and geographical data already dealt with, that the author proceeds, in part V, to put forward his views on the evolutionary history of the genus.

Part VI, written in collaboration with H.-M. Wheeler and P. C. Hutchison, is a monographic taxonomic description of all the *Nicotiana* species recognized, most of which are figured. It is hardly necessary to state that this work is an essential source of information for all students of the genus. It is also one of the most important treatises on plant evolution that have yet appeared and is therefore of general botanical interest.

It is not possible, with so huge a corpus of information, to comment systematically on the text. It would be fair to state, however, that the general outline of Prof. Goodspeed's reconstruction of the evolutionary history of *Nicotiana* appears well-substantiated. It is possible to feel some uneasiness about the use of such terms as *progeneric reservoir*, but it is probable that no implication is intended that does not accord with current neo-Darwinian concepts.

Some disappointment is occasioned by the traditionalist treatment of taxonomy in part VI. Had the cytological data in parts III and IV been incorporated, even if only in summary form, in this section, then an extremely valuable taxonomic account would have resulted. As it is, the copious morphological data are counterbalanced by no more than a mention of the chromosome number and a short comment, often the most illuminating section of the specific description, on affinities. The impression is therefore created that taxonomy is primarily concerned with external morphology, an unbalanced point of view that the earlier part of the book had done much to dispel. Also, the species concept employed does not appear to have benefited much from the genetical atmosphere in which it finds itself. Thus we find assemblages of vicariant populations such as *N. repanda*, *N. stocktonii* and *N. nesophila*, or *N. trigonophylla* and *N. palmeri*, in each of which the intragroup hybrids show complete or nearly complete chromosome pairing, in which nevertheless, the component vicariants are regarded as specifically distinct. It is obvious that such species are not in the same genetical category as such well-marked species as *N. thyrsoflora*. A word of appreciation is due to the illustrators whose work contributes greatly to the value of the taxonomic treatment in part VI.

Kew Bulletin no. 3, 1953

The genus *Nicotiana**.—Before the discovery and invasion of America by Europeans, our ancestors existed, more or less miserably, without the potato, maize, quinine, and tobacco. To the botanist, the genus *Nicotiana* has interests other than the narcotic properties of the products manufactured from some of its species. No doubt attention has been particularly drawn to it because of the commercial value of tobacco crops but cytologists, geneticists, taxonomists, and horticulturists have found in it a favourable material for research. Most of this has been published in large numbers of papers in many different journals. One therefore welcomes Professor Goodspeed's authoritative account of the sixty species he recognizes as comprising the genus *Nicotiana* and of which he grew under controlled conditions all but four.

The book is divided into six parts, dealing respectively with distribution, morphology, cytology of species, cytology of F_1 interspecific hybrids, phylaxis, and taxonomy. Seventy-five per cent. of the species occur in the Americas and twenty-five per cent. in Australia and some South Pacific islands. The ranges of the subgenera, sections, and species are considered in detail and, combined with cytogenetical and taxonomic facts, throw much light on the probable history and evolution of the genus. All the fifteen Australasian species are members of the section *Suaevolentes*, subgenus *Petunioides*. The generic range favours a previous connection between South America and Australia via Antarctica. As full a knowledge as possible of the morphology of all parts, vegetative and reproductive, of the constituent species of such a genus as *Nicotiana* is essential as a preliminary to cytogenetical studies if these are to be understood and interpreted in broader terms than those of limited karyology. Both gross morphology and anatomy here receive the attention they deserve.

The cytological investigation of *Nicotiana* has been extensive and intensive. Professor Goodspeed himself has been a leader in this research. For many years he made determinations of chromosomes from "root tips or other vegetative tissues and/or of MI and MII in PMC. Recently, the first division in the microspore has been studied in detail in all but seven of the species recognized." This quotation gives some indication of the thoroughness characteristic of this monograph. There is considerable variation in the cytology of the species. Haploidy has been frequently observed; autopolyploidy can be readily induced by a variety of treatments; and aneuploidy has been reported in certain species. Evidence is given in favour of 6 being the basic chromosome number of

the genus. The chromosomes are relatively small but karyotypes have been worked out for most of the species and are given in a series of text figures. The cytology of reproduction is illustrated by a series of instructive and clear plates. Euploidy, aneuploidy, and amphiploidy are considered in detail since their importance is considerable in evolution within the genus in which "ploidy" of one kind or another is widespread. Pairing and behaviour in the first meiotic division are treated at length.

In part 5, the factual evidence presented earlier is interpreted in terms of species origins, relationships, and evolution. While 6 may well have been the original basic number for the genus *Nicotiana*, and for its family, the *Solanaceae*, "with the doubtful exception of a species of *Capsicum* there are today no 6-paired species in the *Solanaceae*". It might be safer to add "as so far cytologically studied and the results published". Anyhow, ploidy has resulted especially in 12-paired and 24-paired levels. Amphiploidy superimposed on amphiploidy is, it is concluded, "the basic evolutionary process responsible for the 6-12-24 paired sequence in the genus". Autoploidy has apparently been insignificant. The importance of hybridization in evolution has, however, not been limited to amphiploidy since hybridization without chromosome doubling has acted both in the origin of sections and in speciation. The evolutionary effectiveness of mutations is unquestioned. Mutation has provided the material basis to variability at any taxonomic level. However, "The effect of mutation in process on any given level is difficult to document since it is not readily distinguishable from that of segregation of gene differences accumulated on an earlier level nor from that of chromosome alteration which can be demonstrated to occur".

The final part is an excellent account by Professor Goodspeed, Helen Max-Wheeler, and Paul C. Hutchison, of the taxonomy of *Nicotiana*. This gives concise descriptions, keys, references, synonyms, ranges, and comments under the sixty species taxonomically classified into subgenera and sections. Black-and-white text illustrations supplement the descriptions. A bibliography of literature cited and an adequate index are provided.

From the brief summary here given of the ground covered by this book it should be evident that it deserves study by every botanist interested in evolutionary problems. To those who envisage an increasing importance for synthetic taxonomy it justifies optimism. Those who continue to doubt whether taxonomy can be so extended as to include such a wealth of new data as here presented will either have to ignore it or they will have to wangle out of a difficult position. It is probably too much to expect them to change their views.

In addition to welcoming this book as a marked contribution to modern synthetic taxonomy and congratulating the author on its contents, a word of appreciation must be given to the Chronica Botanica Company for its publication. It is understood that copies can be obtained in this country from Wm. Dawson and Sons, Ltd., Cannon House, Macklin Street, London, W.C.2.

W. B. TURRILL.

* The Genus *Nicotiana*, by Thomas Harper Goodspeed, *Chronica Botanica* 16, Number 1/6, Waltham, Mass., U.S.A. 1954, pp. 536. 12-50 dollars.

2

Botany

GOODSPEED, THOMAS HARPER

The Genus Nicotiana: origins, relationships, and evolution of its species in the light of their distribution, morphology, and cytogenetics. Waltham, Mass. Chronica Botanica; New York, Stechert-Hafner, 536 p. illus. plates, maps, tables. 25 cm. (Chronica Botanica, vol. 16) \$12.50. 54-12802.

THE genus *Nicotiana*, of the potato family, contains the tobacco plant cultivated the world over, the Indian tobacco that is now cultivated chiefly as a source of nicotine, and several well known garden flowers. Most of its species, however, have been little known by botanists. Professor Goodspeed has devoted his life to a study of these plants; and the present volume, addressed primarily to the professional botanist, summarizes his investigations. Fifty-six of the sixty known species have been cultivated in the University of California Botanical Garden, of which Dr. Goodspeed is the director; their cytology, genetics, morphology, and geographic distribution have been studied intensively by Dr. Goodspeed and his students; five expeditions have been sent to South America to collect material. Giving, as they do, the most complete study of any large plant genus, the results represent a milestone in the history of botany. The book concludes with a commendable taxonomic treatment, written in association with Helen-Mar Wheeler and Paul C. Hutchison, both of the Botanical Garden staff.

GOODSPEED, THOMAS HARPER. b. 1887. Brown University, A. B., 1909; University of California, Ph. D., 1912. Department of botany, University of California, Berkeley, Calif.

U.S. Guard. Book Review 11(4): 1955.

Beleg Biologie 79 (1976)

● Thomas Harper Goodspeed: The genus *Nicotiana*, Origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics. (Chronica Bot. Vol. 16.) (Die Gattung *Nicotiana*. Herkunft, Verwandtschaft und Evolution ihrer Arten im Licht ihrer geographischen Verteilung, Morphologie und Cytogenetik.) Waltham, Mass.: Chronica Botanica 1954. XXI, 536 S., 118 Abb. u. 50 Tab. geb. \$ 12.50

Die moderne Monographie einer bedeutenden Pflanzengattung! In den ersten vier Teilen des Buches wird aus der geographischen Verteilung, der Morphologie, Anatomie (sehr eingehend die sehr variable Behaarung) und der Cytologie der Arten und vieler Bastarde das Material zusammengestellt und kritisch diskutiert, das dann im 5. Teil die Zusammenfassung über den derzeitigen Stand der Forschung über die Phylogenie gestattet. Teil VI bringt in Zusammenarbeit mit H. M. Wheeler und P. C. Hutchinson einen neuen Bestimmungsschlüssel und die systematische Beschreibung aller bekannten Arten der Gattung. Bis auf 4 sind alle 60 beschriebenen Arten eingehend karyotypisch charakterisiert. Dem Hauptautor standen jahrzehntelange Erfahrungen mit einer überwältigend großen Menge lebender Pflanzen und die persönliche Kenntnis vieler Rassen- und Artbastarde zur Verfügung. Auf die Kultur von *Nicotiana tabacum* und auf die vielen interessanten Fragen der Physiologie und Pathologie der Gattung läßt sich die Monographie aber nicht ein. Sie ist gut ausgestattet. Der taxonomische Teil ist mit klaren Strichzeichnungen der äußeren Morphologie illustriert. Auch die Karten und Tabellen vermitteln stets eine gute Übersicht. — Jedem, der sich mit den allgemeinen Fragen der Evolution der Organismen beschäftigt, kann das Studium eines solchen Buches sehr empfohlen werden. Das Zusammenwirken sehr verschiedener Faktoren wird deutlich; eine allzu simple Stammbaumkonstruktion durch das mehrfache Mitwirken der Amphidiploidie wird unmöglich gemacht.

G. Melchers (Tübingen).

GOODSPEED (T.H.) - The genus *Nicotiana*; 1 vol. de 536 p., 118 fig., 50 tabl., The Chronica botanica CO, Waltham, Mass. (U.S.A.), éditeur; dépositaire en France: Librairie P. RAYMANN et C^{ie}, rue de Tournon, Paris-VI^e (prix relié: 12 doll. 50), 1954. - Il ne saurait être question d'analyser, même de façon succincte, cette remarquable monographie d'un genre auquel l'auteur a consacré de nombreuses années d'étude. C'est le résultat de ses propres travaux et de la lecture de ceux des botanistes qui, dans le monde, se sont plus ou moins intéressés à ce genre (dont de-ci de-là il est amené à rectifier les conclusions d'ailleurs) qu'il nous apporte dans ce remarquable ouvrage. Au total, l'auteur admet soixante espèces, et le sixième chapitre, écrit en collaboration avec H. M. WHEELER et P. C. HUTCHINSON, est consacré à leur étude taxinomique, abondamment illustrée puisqu'une figure sous forme de planche est réservée à chacune d'elles. Ce chapitre mis à part (170 pages), les autres sont consacrés à la répartition géographique des espèces (avec cartes), la morphologie, l'anatomie et tout spécialement les trichomes, enfin la cytologie. L'auteur s'est particulièrement arrêté sur les problèmes Caryologiques, et il étudie de façon détaillée les Caryotypes, la méiose, les phénomènes d'euploïdie, d'aneuploïdie et d'amphiploïdie. Un chapitre est consacré au comportement de la M₁ chez les hybrides. Toutes les notions ainsi acquises lui permettent de traiter de l'origine des espèces, des relations entre elles et de leur évolution, ainsi que d'envisager l'avenir du genre lui-même qu'il estime devoir s'enrichir d'espèces nouvelles, hautement polyploïdes, et s'étendre géographiquement. - A. EICHHORN.

Revue de Cytologie et de Biologie végétales
Tome XVI

Thomas Harper GOODSPEED. - The Genus *Nicotiana*. Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics. 1 vol. XXI-566 p., 118 fig. Edité par Chronica Botanica. Waltham Massachusetts, U.S.A., 1954. En vente à Paris à la Librairie, P. Raymann. Prix : 12 \$ 50.

Dans cette remarquable monographie on trouvera étudiées successivement d'abord la répartition dans le monde du genre *Nicotiana* en Amérique et en Australie, à l'aide de cartes très claires et en se basant sur le nombre chromosomique des diverses espèces; puis la morphologie et l'anatomie de ce genre. En particulier, on remarquera une étude très attentive de la répartition des trichomes, de leur forme et de leur situation, ainsi que du nombre et de la forme des chromosomes; de la cytologie et du mode de reproduction des diverses espèces représentées par de très belles planches. Toute une partie de l'ouvrage est du reste consacrée à l'étude détaillée des hybrides de *Nicotiana* à la première génération, ainsi qu'aux relations interspécifiques, à l'évolution et à l'avenir du genre *Nicotiana*.

Dans une dernière partie taxonomique, réalisée avec la collaboration de H.-M. WHEELER et de P.-C. HUTCHINSON, on pourra lire une étude très fouillée de la taxonomie des *Nicotiana* dont les 60 espèces sont successivement décrites et bien représentées.

Cet ouvrage très bien compris et soigneusement documenté est un modèle qu'on souhaiterait posséder pour les principaux genres de Végétaux. Il rendra de grands services à tous les Botanistes.

AD. DAVY DE VIRVILLE.

Revue Générale de Botanique

(2)

The Genus *Nicotiana*

Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics. By Prof. Thomas Harper Goodspeed. (*Chronica Botanica*, Vol. 16.) Pp. xxii + 536 + 118 plates and illustrations. (Waltham, Mass.: The Chronica Botanica Company; London: Wm. Dawson and Sons, Ltd., 1954.) 12.50 dollars. *2/205*

A FEATURE of agricultural botany to-day, in both warm and temperate climates, is the intensive study that is often given to all the members of any genus that happens to contain crop plants or economic plants of some kind. How valuable this kind of work can be has been well demonstrated with the potato.

The appearance now of a most comprehensive monograph of the genus *Nicotiana*, to which tobacco belongs, is therefore very much to be welcomed. These investigations on the genus *Nicotiana* have been carried out by Prof. T. H. Goodspeed at the University of California Botanic Garden during the past thirty years and were actually initiated even earlier (in 1904). Of the sixty species known to belong to the genus *Nicotiana*, no less than fifty-six were cultivated in the Botanic Garden—a fine achievement. Five different expeditions were made to South America, and these accounted for a good deal of the living material. Actually, only two species, *N. tabacum* and *N. rustica*, are of direct economic value or yield commercial smoking tobacco at the present time. In its original distribution, before being spread by man, the genus was more or less restricted to the Americas, with a few species in Australia and some islands of the Pacific.

The author divides his monograph into six parts, the first part dealing with distribution, while successive parts deal with morphology, cytology of species, cytology of F_1 interspecific hybrids, phyletic (or evolution) and taxonomy of *Nicotiana*. Full descriptions, accompanied by line-drawings, are given for each of the sixty species. In the sections on cytology, karyotypes of all but four species and complete meiotic sequences in representative species and hybrids are illustrated. The work is a good example of modern treatment in speciation and probable evolution in plants. It should be of special interest to botanists and geneticists and to many others engaged on scientific work with tobacco or the related species.

GOODSPEED, Thomas Harper: *The Genus Nicotiana. Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics.* Chronica Botanica, Volume 16. — Gr.-8°, XXII + 536 Seiten. 118 Abbildungen, Ganzleinen. — The Chronica Botanica Co., Waltham; GEROLD & Co., Wien. — 1954. — § 12,50.

Diese hervorragende Monographie ist die Frucht von Studien, die vor 50 Jahren an der kalifornischen Universität Berkeley begonnen wurden. Unterstützt durch einen Stab von Mitarbeitern und durch die Ergebnisse von fünf besonders für diese Aufgabe ausgerüsteten Expeditionen nach Südamerika gelang es dem Verf., fast alle Sippen der südpazifisch-amerikanisch-australischen Gattung *Nicotiana* auch lebend zu untersuchen und über 200 Bastarde nicht nur herzustellen sondern auch zu analysieren. Außerdem wurden die Belege von fünfzig großen Herbarien durchgearbeitet. Die Summe aller Befunde wurde zu diesem eindrucksvollen, in seiner klaren, übersichtlichen Gestaltung bewunderungswürdigen Gesamtbild der Gattung vereinigt.

Die Monographie ist in 6 Teile gegliedert: I (Distribution), II (Morphologie), III (Cytology of Species), IV (Cytology of F, Interspecific Hybrids), V (Phylysis), VI (Taxonomy of *Nicotiana*). Die Tatsachen der vergleichenden Chorologie — Punktkarten! — und Morphologie werden immer wieder unter eingehender Berücksichtigung der geologischen Geschichte der Teilareale mit den zytologischen Ergebnissen in Zusammenhang gebracht und für stammesgeschichtliche Folgerungen ausgewertet. Dies gilt besonders für die Bilder des Karyotypus fast aller Arten und für die ausführlich besprochenen Kreuzungsversuche. Auf dieser Grundlage wird in schematischen Zeichnungen die vermutliche Stammesgeschichte entwickelt und sogar ein Blick in die Zukunft der Gattung gewagt. Die Krönung der Abhandlung bildet Teil VI, der unter Mitwirkung von H.-M. WHEELER und P. C. HUTCHINSON in unübertrefflicher Vollendung abgefaßte taxonomische Abschnitt. Die Gattung *Nicotiana* wird kurz beschrieben und in die herkömmlichen drei Untergattungen gegliedert; der Nomenklatur-Code würde jetzt allerdings für die den Gattungstypus enthaltende Untergattung und Sektion die Wiederholung des Gattungsnamens verlangen. Die 60 Arten — LINNÉ hatte 1753 nur 4 genannt — werden also in den drei Untergattungen *Rustica* (mit 2 Sektionen und 9 Arten), *Tabacum* (mit 2 Sektionen und 6 Arten) und *Petunioides* (mit 9 Sektionen und 45 Arten) ohne überflüssigen Ballast knapp und treffend charakterisiert und in ausgezeichneten Bildern (Tracht, Blatt- und Blütenmerkmale) vorgestellt. Mehrere Indices, darunter ein sehr ausführlicher Subject Index beschließen das technisch mustergültig ausgestattete Werk. — Mit dieser Monographie haben Verf. und Verlag eine moderne Glanzleistung geschaffen, die eine tiefe Kluft von vielen klassischen Monographien des vergangenen Jahrhunderts trennt.

WIDDER

JACOBSEN, Hermann: *Handbuch der sukkulenten Pflanzen.* Beschreibung und Kultur der Sukkulenten mit Ausnahme der *Cactaceae*. — Band II: *Poecaea* bis *Zygophyllum*. — Lex.-8°, IV + S. 617 bis 1124, 1 farbige Tafel, Textabb. 520 bis 991, Ganzleinen. — VEB Gustav FISCHER Verlag, Jena. — 1954. — DM 48.—. — Band III: *Mesenbryanthemaceae*. — Lex.-8°, IV

This distinguished monograph is the fruit of studies that were begun 50 years ago at the University of California, Berkeley, supported by a staff of collaborators and by the results of five expeditions to South America especially equipped for this project, it was possible for the author to examine nearly all members of the south-Pacific-American-Australian genus *Nicotiana* and not only to create over 200 hybrids but also to analyse them. Vouchers of fifty large herbaria were also worked over. The sum of all findings has been brought together into this admirable and impressive survey of the genus, in a clear and methodical form.

The monograph is divided into 6 parts: I (Distribution), II (Morphology), III (Cytology of Species), IV (Cytology of F1 inter-specific Hybrids), V (Phylogeny), VI (Taxonomy of *Nicotiana*). The data of comparative Chorology(?) -- dotted maps! -- and morphology are repeatedly and exhaustively considered in association with the geological history of the separate areas and the cytological data, and are evaluated for theories concerning lines of development. This applies especially to the pictures of the karyotypes of nearly all species and for the detailed hybridizing experiments. On this foundation is developed schematically the probable lines of development, and even a glance into the future of the genus is attempted. The crowning work of the treatise is Part VI which, with the collaboration of H.-M. Wheeler and P.C. Hutchinson, gives a taxonomic survey of incomparable perfection. The genus *Nicotiana* is briefly described and divided into the three customary subgenera; of course, under the present Code of Nomenclature, it is required that the subgenus and section containing the generic type retain the generic name. The 60 species -- Linnaeus in 1753 had named only 4 -- are therefore ⁽⁶⁰⁾ presented as the three subgenera *Rustica* (with 2 sections and 9 species), *Tabacum* (with 2 sections and 6 species) and *Petunioides* (with 9 sections and 45 species), without superfluous information, concisely and suitably characterized and with distinguished illustrations (aspect, leaf and flower characters). Several indices, including a very detailed subject index, conclude this model technical work. -- This monograph is a brilliant performance on the part of the author and publisher and is separated by a wide gulf from the many classic monographs of the past centuries.

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T. H. GOODSPEED: *The Genus Nicotiana. Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics.* Chronica Botanica Company, Waltham. 536 S., 118 Abb. \$ 12.50.

Verfasser ist Direktor des Botanischen Gartens der Universität in Berkeley, California, in dem vor 50 Jahren die Tabakstudien durch W. A. SETHCHELL aufgenommen worden waren. GOODSPEED begann kurz danach seine Untersuchungen vor allem in cytologischer und cytogenetischer Hinsicht. Durch eine Reihe von Expeditionen nach Südamerika wurde ein umfangreiches Material von neuen und wenig bekannten Arten und Unterarten der Gattung *Nicotiana* zusammengebracht. So kam eine praktisch vollständige, lebende Sammlung der *Nicotiana*-Arten zustande, die nun nicht allein morphologischen Studien diene, sondern cytologischen und genetischen, so daß die Systematik in moderner Weise unterbaut werden konnte. Dies findet im 6. Teil dieses Werkes seinen Niederschlag, in dem GOODSPEED mit seinen Mitarbeitern H.-M. WHEELER und P. C. HUTCHISON die Taxonomie der Gattung ausführlich und mit Bestimmungsschlüsseln versehen darstellt, wobei die wichtigsten Arten und Unterarten auf 60 sorgfältig gezeichneten ganzseitigen Tafeln vorgestellt werden. Da überhaupt nur 60 Arten sicher abgegrenzt werden können, stellt dieser 170 Seiten umfassende Teil infolge seiner ausführlichen und gründlichen, die Literatur sorgfältigst berücksichtigenden Bearbeitung eine wertvolle Bereicherung der Literatur und einen künftig unentbehrlichen Führer bei allen systematischen und nomenklatorischen Entscheidungen dar. Diesem die Ergebnisse verschiedenartigster Arbeiten auswertenden systematischen Kapitel gehen mehrere andere voraus. Einen Hauptteil bildet die geographische Verbreitung der Gattung und der Arten, wobei Karten die großen geschlossenen Vorkommnisse in Südamerika, Australien und Nordamerika illustrieren. Der 2. Hauptteil behandelt die Morphologie: Gesamthabitus, Blatt, Blütenstand, Blüte und Frucht, und eine Charakteristik der Sektionen. Im anatomischen Kapitel wird besonderer Wert auf die Haare gelegt, ihre Gestalt, ihre Verteilung auf der Pflanze und ihr Vorkommen in den Sektionen und Arten. Dabei werden Artbastarde und Amphiploide mit einbezogen. Der 3. und 4. Hauptteil behandeln die Cytologie auch der F_1 -Hybriden in einer meisterhaften Darstellung. Im 5. mehr spekulativen Teil werden die phylogenetischen Beziehungen der Sektionen und Arten, ihre Entstehung und Geschichte und die Zukunft der Gattung erörtert, wobei die cytologischen Momente betont berücksichtigt werden. Das ausgezeichnete Werk wird nicht allein den Tabakfachmann interessieren, es ist auch von allgemeinerer Bedeutung für die Behandlungsweise der systematischen Probleme und besonders auch der Kulturpflanzen.

Prof. Dr. K. MORME, Gatersleben

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1239. GOODSPEED, T. H.

The genus *Nicotiana*. Origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics.

Chronica Botanica 1954, 16 (1/6): i-xxii and 1-536, 9½ × 6 in., bibl. 398, illus., \$12.50.

Among the noteworthy features of genetical research during the past half-century is the impetus it has given to the taxonomic study of certain genera of plants. For these studies species have been collected from all over the world, their morphological characters have been examined in new and greater detail, and the genetical and cytological behaviour of both them and their hybrids has been investigated. As a result, information has been amassed which must be fundamental to any taxonomic, as well as genetic, appraisal of the group and its evolution.

Studies of this kind have been in progress on the genus *Nicotiana* for nearly fifty years at the hands of Dr. Goodspeed and his collaborators (among whom R. E. Clausen must receive special mention) in the University of California. The outcome of the work is now made available to us in a single comprehensive volume. The first five parts of the monograph cover the distribution, morphology and cytology of the species and their hybrids, and the phylaxis of the genus. The sixth part, in the preparation of which H.M. Wheeler and P. C. Hutchinson have collaborated with Dr. Goodspeed, provides full taxonomic descriptions of all the many species which are sufficiently known, together with keys for their identification.

In the main the book is devoted to the presentation of the observations which have been made on the distribution, morphology and cytology of the genus, and a vast amount of information it provides. At various places, however, and especially at the end of the chapters, short comments are interpolated on the interpretation and significance of the observations. The first chapter also gives a brief statement of the aims and argument, while the last two of part five deal respectively with the past evolution and the future prospects of the genus. The scheme suggested for the origin, evolution and relationships of sixty species, involving as it does both the differentiation of three great lines of descent and their subsequent interplay in allopolyploidy, will be read with interest; but it is a disappointment to find only brief mention of such properties as the inbreeding and outbreeding of the various species, which recent developments in the study of population genetics has shown to be of great significance. This is especially so as the genus would seem to offer excellent material for an investigation of the rise and distribution of inbreeding and outbreeding devices, and of their relations to one another and to such factors as polyploidy, habitat and geographical distribution.

It is, however, as a compendium of information that Dr. Goodspeed's book must be judged, and by this test it must secure its place among the various monographs which have been appearing of recent years, and in which the technique of genetics and cytology have been added to the older methods of study to give us a broader basis for our taxonomic and evolutionary judgments. Reference to it can hardly be avoided by anyone interested in the newer taxonomy or in the genus *Nicotiana*.

K.M.

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BOEKBESPREKINGEN

X THOMAS H. GOODSPEED, *The Genus Nicotiana*. Origins, Relationships
and Evolution of its Species in the Light of their Distribution, Morpho-
logy and Cytogenetics. (Chron. Bot. Vol. 16, 1954, XXII + 536 blz.,
118 fig.; geh. US \$ 12.50; Waltham, Mass.: The Chronica Botanica Co.;
Groningen: N.V. Erven P. Noordhoff).

Ik geloof, dat een boek als dit JULIAN HUXLEY voor ogen heeft gestaan toen hij zijn „The New Systematics (1940)” concipieerde. Voor wie bekend is met het werk van GOODSPEED c.s. (o.a. R. CLAUSEN) was dit geen verrassing; zeker niet voor ref., die het voorrecht had in 1939 door GOODSPEED te worden rondgeleid in zijn botanische tuin te Berkeley, waar hij toen al tientallen *Nicotiana*-soorten kweekte (in totaal thans 56 van de 60 met vele hybriden). GOODSPEED bekende mij, langs de weg van cytogenetica en oecologie tot de plantengeografie, de systematiek en de fylogenie te zijn gekomen. Dit is in zijn boek goed bemerkbaar: bijna een derde deel van het boek is ingenomen door de cytogenetische hoofdstukken. Toch is het uitstekend gebalanceerd: het ademt GOODSPEED's meticuleuse en beheerste persoonlijkheid en het boek geeft volledig wat de ondertitel belooft.

Natuurlijk zal ook een alfa-taxonist (zoals ref.) volmondig erkennen dat GOODSPEED's poging tot omega-taxonomie je ware is. Zou men echter alle hogere planten volgens deze methode bewerken — gesteld dat dit mogelijk ware — dan zouden hiervoor naar schatting een 160.000 man-jaren nodig zijn (GOODSPEED begon in 1915). Beoefenaren der alfa-taxonomie behoeven dus voorlopig nog niet naar andere hobbies om te zien.

GOODSPEED's boek is intussen ook door zijn opzet niet wat wij een monografie zouden noemen. De morfologisch geschoolde herbarium-systematicus waardeert het hoofdstuk morfologie, maar zou het anders, wellicht niet beter, maar wel strakker en ook vollediger schrijven, want hij zou niet nalaten er ten minste één bloemdiagram en afbeeldingen van pollen, placentatie en ovula in op te nemen. Ook mist hij een beschrijving van het vaatbundelverloop in de bloem en de anatoom moet het geheel zonder figuren stellen. De alfa-taxonist voelt zich geheel thuis in het bijzondere

Goodspeed, T. H., The Genus *Nicotiana*. Origins, Relationships and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics. Band 16 der *Chronica Botanica*. Herausgegeben von der *Chronica Botanica Co.*, Waltham, Mass. 1954. 536 S., 118 Abb. Geb. \$ 12.50.

Der Verfasser ist seit 40 Jahren durch die Veröffentlichung von mehr als 40 Originalarbeiten an führender Stelle an der Lösung vornehmlich cytologischer, cytogenetischer und evolutionistischer Fragestellungen innerhalb der Gattung *Nicotiana* beteiligt. Er hat nunmehr eine Zusammenstellung der umfangreichen, zum Teil noch unveröffentlichten Forschungsergebnisse aller Autoren publiziert, die sich mit der Morphologie, Cytologie, Phylogenie und Taxonomie der Gattung beschäftigt haben. Es ist auf diese Weise eine Monographie entstanden, deren besonderer Wert in der wohl einmaligen Tatsache liegt, daß praktisch alle bekannten Arten dieser umfangreichen Gattung eingehend berücksichtigt worden sind. In 5 Expeditionen nach Südamerika, dem mutmaßlichen Ursprungsgebiet der Gattung und dem Gebiet, in dem heute noch die meisten Tabakarten beheimatet sind, konnte wertvolles Pflanzenmaterial gewonnen werden. Dem Autor und seinen Mitarbeitern stand im Botanischen Garten der Universität California damit ein praktisch vollständiges Sortiment der Gattung *Nicotiana* zur Verfügung. Es war auf diese Weise möglich, umfangreiche vergleichende morphologische und cytologische Untersuchungen an allen Arten der Gattung vorzunehmen. Darüber hinaus wurde ein Kreuzungsprogramm durchgeführt, in das nahezu alle bekannten Tabakarten einbezogen werden konnten. Gerade die cytogenetische Analyse vieler Artbastarde hat besonders wertvolle Ergebnisse für die Beurteilung evolutionistischer Fragestellungen innerhalb des Genus *Nicotiana* erbracht. Sie hat auch wesentlich zu der neuen taxonomischen Behandlung der Gattung beigetragen.

Im einzelnen werden folgende Teilgebiete behandelt: Es wird zunächst die gegenwärtige geographische Verbreitung aller Tabakarten anhand von Kartenskizzen sehr eingehend dargestellt, wobei besonderer Wert auf den Zusammenhang zwischen Verbreitung und Chromosomenzahl der betreffenden Species gelegt wird. Im morphologischen Teil des Werkes werden Blattgestaltung, Aufbau der Infloreszenz, Blütenbau, Aestivation, Morphologie der Antheren, Griffel und Narben, der Früchte und Samen sowie die Anatomie der Haare in Verbindung mit ganzseitigen Abbildungen ausführlich dargestellt. Besonders eingehend sind die cytologischen Verhältnisse sämtlicher Arten behandelt. So war es möglich, die Karyotypen von 55 Species im Stadium der mitotischen Metaphase zu ermitteln. Unterschiede in der Chromosomenlänge sowie in der Lage des Centromers gestatteten die Klassifizierung vieler Metaphasechromosomen und ermöglichten auf diese Weise einen Vergleich der Karyotypen verschiedener Arten. Neben der Mitose sind umfangreiche Studien an der Mikro- und Makrosporangese vorgenommen worden. Ein besonderes Kapitel ist den natürlichen polyploiden Arten sowie den experimentell erzeugten polyploiden Formen mit ihren zum Teil sehr komplizierten cytologischen Verhältnissen und den spontan oder in Verbindung mit experimentellen Eingriffen aufgetretenen Haploiden gewidmet. Besonderer Wert wurde auf eine eingehende Bearbeitung der zahlreichen Artbastarde im Hinblick auf die Paarungsverhältnisse während der meiotischen Prophase gelegt. Die Ergebnisse an dem sehr umfangreichen Material sind in zahlreichen Tabellen übersichtlich geordnet. Die cytologischen Befunde werden in Verbindung mit den morphologischen Ergebnissen für die Bearbeitung der gegenseitigen Verwandtschaftsverhältnisse und der phylogenetischen Entwicklungstendenzen innerhalb der Gattung herangezogen. Unter Mitarbeit von H. M. Wheeler und P. C. Hutchinson wurde schließlich die Taxonomie der Gattung *Nicotiana* neu gestaltet. Es sind alle bekannten Arten der Gattung taxonomisch eingehend beschrieben und in Form ganzseitiger Abbildungen wiedergegeben.

Das Werk gibt in seiner umfassenden Darstellung nicht nur einen tiefen Einblick in die spezifischen cytologischen und phylogenetischen Verhältnisse der Gattung *Nicotiana*, sondern es enthält eine Fülle von Ergebnissen und Erkenntnissen, die weit über den Rahmen der Gattung hinausgehen und dem aufgeschlossenen Leser allgemeingültige Gesetzmäßigkeiten sowie die Art ihrer Bearbeitung veranschaulichen.

A. Scheibe, Göttingen.

Originalarbeit Botanik 20/10/54, 1956.

X

~~Review~~ by Parodi
in Revista Agronomica
Argentina de
vol 23, # 1, p 49, marzo 1956

MONOGRAFIA DEL GENERO NICOTIANA (1).— Los estudios del género de solanáceas *Nicotiana* se iniciaron en el Jardín Botánico de la Universidad de California, en Berkeley, en el año 1904. Su propulsor fué el famoso botánico W. A. Setchell y a ellos se vinculó enseguida el doctor Thomas Harper Goodspeed, autor de la obra que comentamos, dedicando puede decirse que toda su vida al estudio de este género. Muchos otros botánicos pueden mencionarse en conexión con estos estudios, como R. E. Clausen, H. M. Wheeler, etc. A los cincuenta años de la iniciación de las investigaciones sobre el tabaco y sus congéneres, el doctor Goodspeed ha publicado una magnífica obra en la que se reúnen todos los resultados obtenidos no sólo por los botánicos de la Universidad de California, sino también por los demás investigadores de todo el mundo relacionado con el tema.

La obra está dividida en seis partes: 1. Distribución geográfica; 2. Morfología; 3. Citología; 4. Citología de los híbridos interespecíficos; 5. Filogenia, y 6. Taxonomía.

La primera parte, distribución geográfica, ocupa cuatro capítulos ilustrados con excelentes mapas. Las 60 especies del género se distribuyen en tres centros principales: América del Norte y las Antillas, América del Sur, y Australia y Polinesia. El 60 % de las especies son sudamericanas y 18 de ellas (un 30 % del género) se hallan en la Argentina, 3 de ellas endémicas. En el Perú hay 12 especies (6 endémicas). Chile y Bolivia tienen 9 especies cada uno (4 endémicas en Chile y 2 endémicas en Bolivia). En Australia y Pacífico austral se hallan 15 especies y en América del Norte nueve. Varias especies silvestres han sido utilizadas por los aborígenes de América en forma similares al tabaco. Lo mismo ocurren en Australia. Según el autor, de acuerdo a los datos geológicos y geográficos, el centro de origen del género se halla sin duda en América del Sur, de donde *Nicotiana* emigró a Norte América, tal vez a lo largo de América Central en una época menos cálida y húmeda, y a Australia por un paso antártico.

Los dos capítulos que incluye la parte dedicada a Morfología tratan la morfología general y la anatomía y los tricomas respectivamente. Se detallan formas de hojas, ilustradas claramente, inflorescencias,

(1) *The Genus Nicotiana*, by T. H. Goodspeed. *Chronica Botanica*, Vol. 16, xxii + 536 pág., 50 tab., 118 lám., 1954. (Buenos Aires: Acme Agency, 12.50 dólares).

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occidental. Para cada una de estas regiones boscosas se dan datos sobre clima y otras condiciones del ambiente, composición de las comunidades botánicas principales, posibilidades forestales, etc. El capítulo segundo se ocupa de las "Maderas argentinas": consideraciones generales", y trata de los caracteres de la madera, coloración, vetado, brillo, textura, tipo de grano, disposición de los poros, etc. También se estudian las diferentes aplicaciones de nuestras maderas, tratándose especialmente los enchapados, tan utilizados modernamente.

El capítulo tercero, que es el más extenso, es una "Enumeración y descripción de las especies", incluyéndose 111 árboles indígenas para cada uno de los cuales se dan los nombres vulgares, el nombre científico, la distribución geográfica, con localización de las principales masas boscosas, la descripción del árbol y sus características culturales, la descripción de la madera (caracteres estéticos, físico-mecánicos, macroscópicos y microscópicos), sus aplicaciones.

El capítulo cuarto es una "Clave para la identificación de las maderas argentinas" tratadas en la obra y está realizada en colaboración con los ingenieros agrónomos Julio A. Castiglioni y Elvira M. Rodríguez. Lo ilustran 111 láminas con fotomicrografías de leños, que forman el capítulo quinto. El sexto lo constituyen la Bibliografía y los Índices.

La nueva obra de Tortorelli es todavía más útil que la anterior y sin duda constituirá el *vademecum* de cuantos tienen que ocuparse de bosques o de maderas en la América austral. Su presentación es excelente siendo solo de lamentar que las numerosas fotografías de árboles y de bosques estén intercaladas en el texto y, debido al papel, hayan perdido claridad. Las dos láminas en color, pintadas por E. Koch, con aspecto y detalles de la madera por S. Kanof, son muy hermosas y representan un bosque de quebracho colorado (*Schinopsis balansae*), "la especie de mayor importancia económica actual de la dendrología argentina", y un bosque de araucarias de Misiones (*Araucaria angustifolia*), "la especie de mayor importancia económica futura". Una obra, en resumen, que honra a su autor y a sus editores. — A. L. Cabrera.

IMPORTANCIA BOTANICA DE LOS VIAJES DEL CAPITAN COOK (3).— El doctor Elmer Drew Merrill, fallecido recién

(3) *The Botany of Cook's voyages and its unexpected significance in relation to Anthropology, Biogeography, and History*, by E. D. Merrill, *Chronica Botanica*, Vol. 14, N° 5/6, pág. 161-384, Pl. 80-93, 1954. Waltham, Mass.: The Chronica Botanica Co.; Buenos Aires: Acme Agency. (4.75 Dólares).

THE GENUS NICOTIANA

T.H. GOODSPEED. *Chronica Botanica Company: Waltham, Wm. Dawson: London, 1954. xxii + 536 pp. (illus.) \$12.50*

Most plant taxonomy is based on characters that can be seen on dead plant fragments with the eye, unaided or aided only by a hand lens. Quite frequently, such examination takes place thousands of miles away from the scene of collection and in these circumstances it is not surprising that taxonomy sometimes degenerates into what has been aptly but unkindly called 'the exhilarating sport of name-changing', specimens being mounted, shuffled and matched like so many postage stamps. This kind of taxonomy is fortunately rare, for the results are dreadful. But even the best museum taxonomy is bound to be both incomplete and incorrect in some particulars, for the very nature of its materials forbids accuracy.

The function of taxonomy is not simply to name plants (that can be done on a postage stamp basis); it is to arrange them in biologically significant groups and to provide names for those groups. Of its nature, museum taxonomy can provide only clues to biological significance. Field work provides more information and experiment more still. The ideal is a taxonomy which draws on all sources of information, a taxonomy which is firmly founded on cytogenic experiment but which also has command of all the relevant facts of geography, ecology and even anthropology, which obeys the International Rules of Nomenclature but regards biological sense as more important than rules and is on a scale large enough to avoid distortion of the emergent picture by biased sampling. The latter is important for there is a dangerous (though very natural) tendency to select pairs or small groups of species that illustrate in dramatic fashion one feature of evolutionary taxonomy at the expense of the larger picture; how many Ph.D.'s have been awarded for studies of meiotic misbehaviour in sterile F_1 hybrids between two nearly allied sympatric species? And how many interfertile pairs have been passed over because it is impossible to write a thesis on meiotic normality?

This 'ideal taxonomy' demands much time, money, space, facilities for distant travel, an exceptionally wide grasp of diverse biological facts, and

great persistence on the part of the investigator in filling in the duller details; and it rarely provides either spectacular economic results or a useful series of short-term research projects. It is therefore rare and in this reviewer's opinion there are probably fewer than a dozen genera or major subgeneric units which can be described as tolerably well understood. Even our crop plants are lamentably little known-the state of rice botany is one of the major disgraces of a civilization which calls itself 'scientific'.

This volume meeting, as it does, all the demands of the 'ideal taxonomy' must place the group at or near the head of the list of 'understood genera'. The volume is a large one; roughly two-thirds are devoted to Parts I to V (the distribution, morphology, cytology of species and hybrids, and phylesis) by Goodspeed alone, the remaining one-third to Part VI (taxonomy) by Goodspeed, H.M. Wheeler and P.C. Hutchinson. Part I is preceded by a very useful chapter entitled 'Objective and Argument' which outlines the author's views on phylesis, as a background to the formidable mass of detail that follows. The viewpoint throughout is taxonomic, with a strong phyletic slant, and the economic botany of the group is explicitly excluded. Some 60 species are recognized, arranged in three subgenera: *Rustica* (three sections, nine species), *Tabacum* (two sections, six species) and *Petunioides* (nine sections, forty-five species); the first two subgenera constitute a *Cestroid* series (i.e. sections having *Cestrum*-like characters), the third a *Petunoid* series. The basic chromosome number of the group is probably six (as indicated, for example, by evidence from nucleoli) but polyploidy and secondary reductions have resulted in a complex series of numbers based on $n=9,10,12$ and $16,18,19,20,21,22,24$. Goodspeed's views on phylesis (admirably summarized in many diagrams) may be stated in his own words: '...two alternating mechanisms, genetic differentiation and amphiploidy...to genetic differentiation...introgression has contributed'. The primary centre of origin was southern South America (where, for example, the functionally diploid parents, *N. sylvestris* and *N. otophora*, of the amphidiploid *N. tabacum* are found) but major secondary centres of diversity developed in western North America and in Australia. The facts of distribution, morphology and cytology that support these conclusions are fully set out in many tables and diagrams; the latter (with the possible exception of some cytological drawings photographically reproduced) are generally excellent.

Part VI, the taxonomy of *Nicotiana*, is a formal treatment of the sixty species

complete with keys, specific descriptions, excellent line drawings, by M. Blos of every species, lists of specimens determined and critical comments. The treatment is a model of what such treatments should be and now no botanist has any excuse for misidentifying a well-collected specimen of the genus. The book ends with 18 pages of references, two pages of index to authors and 21 pages of subject index. It is well made and excellently printed as, one feels, it should be for the price, but it seems a pity to disfigure three of the fly and title leaves with the publisher's advertisements.

In conclusion, this reviewer believes *The Genus Nicotiana* to be one of the greatest single achievements in plant taxonomy, a model of what taxonomy should be but so often is not, a monument to the energy and persistence of Professor Goodspeed and his collaborators, and an essential work of reference for the systematist and teacher.- N.W.S.

Trop. Agriculture, Trin., Vol. 33. No. 2, April 1956.

With the Editor's Compliments

Nicotianas

THOMAS H. GOODSPEED: *The Genus Nicotiana*.
Chronica Botanica. \$12.50.

THE GARDENERS' CHRONICLE,
PRINTING HOUSE SQUARE,
QUEEN VICTORIA STREET,
LONDON, E.C.4.

THIS important and imposing work is the culmination of a detailed study of the genus *Nicotiana* which was begun at the University of California Botanical Garden over 50 years ago by the late Dr. W. A. Setchell. At an early stage Professor Goodspeed became associated with this work and since 1915 he has produced a long series of papers dealing principally with the cytology and genetics of the genus. There is no doubt that this is one of the most thorough investigations to which any single genus has been submitted, but this is not surprising as the University of California, where the work was mainly carried out, has in recent years been the source of several highly important researches in which classical taxonomy has been supplemented by intensive morphological, physiological and genetical studies. For example, the treatment of *Crepis* by Professor Babcock, which was sponsored by the University of California in 1947, was hailed as a model of monographic presentation, and this work on *Nicotiana* is in the same category.

The first part deals with the distribution of the genus which is limited to south-western North America, South America, southern Australia and a few southern Pacific islands. Excellent maps showing the geographical range of the genus and its sections are provided and the discussions convincingly suggest how the distribution in the various areas has been determined by geographical history. Part two is concerned with the general morphology of *Nicotiana* and gives a very comprehensive and detailed survey of the various plant organs.

Part three, which is concerned with cytology and genetics, is an advanced knowledge of the subject is required for a proper understanding of these chapters and also, to a lesser extent, for adequate appreciation of part five which deals with the past and present history of the genus. In this part the author is bold enough to prognosticate on the future development of *Nicotiana*. The diagram showing the origin, evolution and relationship of the sections and species is particularly ingenious and clear.

Part six, the largest in the book, is devoted to the taxonomical treatment of the genus and in this Professor Goodspeed has been assisted by Dr. Wheeler and Dr. Hutchinson. This part follows conventional lines with keys to the subgenera, species and sections. With two or three exceptions, descriptions of the 60 species are accompanied by an illustration which gives good details of habit and flower structure in each case.

The genus is one of paramount economic importance and many species are used for ornamental purposes yet these aspects are entirely ignored in this work. The book will thus have a very limited appeal to gardeners.

There is no doubt that it is a product of great industry and is packed with facts, tables, diagrams and data, supported by impressive documentation.

CIENCIA Y TECNOLOGIA

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NOTAS BIBLIOGRAFICAS

Goodspeed, Thomas Harper: *The Genus Nicotiana*, Waltham, Massachusetts, U. S. A., "The Chronica Botanica Co." and New York City, U. S. A.: "Stechert-Hafner Inc.", 1954, XXII-536 pp., 118 figuras e ilustraciones, u\$s 12.50.

Esta obra maestra del catedrático de Botánica y director del Jardín Botánico de la Universidad de California, (Berkeley, California, U. S. A.), forma el volumen 16 de "Chronica Botanica". Consta de seis partes. Las cuatro primeras forman la base de una interpretación (que se desarrolla en la quinta) de los orígenes, relaciones y evolución del género nicotiana (el tabaco). La Parte VI presenta una reorganización taxonómica de esta importantísima planta, con claves de los sub-géneros y descripciones de todas las categorías incluidas en el género.

Durante más de treinta años, el autor se ha dedicado a investigaciones de la planta nicotiana, por medio de exploraciones, experimentos de cultivo de varias especies, y estudios en la distribución, morfología y citología de la planta, logrando reunir una colección de plantas vivas de 56 de las 60 especies reconocidas, la cual hizo posible estudios muy extensos sobre la morfología y citología del género, y experimentos en la hibridación de las varias especies. Ahora, en este libro, cumbre de sus trabajos, ofrece al mundo científico todos los resultados de estas investigaciones en una forma que seguramente servirá como obra básica por largos años en el futuro.

En la parte primera de la obra hay un resumen de la distribución (actual y prehistórica) de nicotiana en el mundo: en América del Sur, en Norteamérica, en Australia y en el Sud-Pacífico. Mapas bien detallados acompañan los cuatro capítulos de esta sección. Esta parte ha de tener gran interés no solamente para los estudiantes de la fitogeografía y la historia de la distribución de las plantas, sino también para todos los que se interesan en la historia geológica de las regiones del mundo donde la nicotiana es planta indígena. Para los lectores de *Ciencia y Tecnología*, los capítulos 3 y 4, sobre la distribución de nicotiana en América del Sur y en Norteamérica tendrán especial importancia porque el Dr. Goodspeed presenta sus teorías sobre la distribución de nicotiana, bien apoyadas con datos detallados de la historia geológica de gran parte del Nuevo Mundo.

La segunda sección presenta informes sobre la morfología y anatomía de nicotiana, y la tercera, una de las más importantes secciones del libro, trata de su citología. Aquí se consideran los

números de las cromosomas, la citología de la reproducción de la planta, la citología de los híbridos, y estudios en euploidia, aneuploidia y amphiploidia. La parte cuarta ahonda más en la citología de los híbridos inter-específicos. En la quinta, el Dr. Goodspeed ofrece sus teorías de la evolución del género: por medio de amphiploidia, hibridación, introgresión y reorganización de los cromosomas.

En la última sección hay descripciones de más de 60 especies y variedades del género nicotiana. En esta parte el autor reconoce la colaboración de la Dra. Helen-Mar Wheeler y del Dr. Paul C. Hutchison. Las ilustraciones (hay un dibujo para cada especie y variedad), demuestran muy claramente todas las diferencias de importancia en la morfología de la planta. También hay ilustraciones de todos los cariotipos, con la excepción de cuatro especies. La evolución entera del género se presenta en diagramas, en las cuales se incluye la derivación de cada una de las 60 especies. Completa el libro una bibliografía muy extensa de todos los trabajos citados.

Como se ve por este resumen, la obra del Dr. Goodspeed debe ser incluida en todas las bibliotecas científicas que se especializan en la historia natural, particularmente en la botánica. Servirá como obra de consulta para los estudiantes en todas las ramas de la botánica, tanto como para los que se dedican a estudios de la genética, citología, fitogeografía, etnobotánica, etc.

Dra. Ida K. Langman
Academy of Natural Science of Philadelphia
Philadelphia, Pennsylvania, U.S.A.

Hall, Thomas S. and Moog, Florence: *Life Science*, New York, U. S. A., John Wiley and Sons, Inc., 1955, X-502 pp., 411 fig., u\$s 6.50.

Los autores, ambos profesores universitarios de Washington, especializados en Zoología, son muy conocidos entre los biólogos. Y si esto no fuera garantía bastante para leer este libro, ellos mismos nos dicen en el prólogo que los distintos capítulos han sido sometidos a la revisión y crítica de biólogos especializados en la respectiva materia. El libro viene anunciado como de texto para el "College" americano; esto es, para la formación de una cultura superior. En los once capítulos de que consta se trata de la vida celular, de las plantas, de los vertebrados e invertebrados, reproducción, origen de las especies y el organismo frente al medio. Es tanta la cantidad y tal la calidad de las ilustraciones, con esquemas, grabados, fotos y

REVIEWS OF BOOKS

GOODSPEED, T. H., The genus *Nicotiana*. Origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics. *Chronica Botanica* 16 (1954), 536 p., 50 tables, 118 plates and figs. Waltham, Mass.: The Chronica Botanica Co; Groningen: N.V. Erven P. Noordhoff. \$ 12.50.

Parts I to IV document an interpretation (Part V) of the origins, relationships and evolution of the species of a representative genus of flowering plants based upon detailed evidence accumulated during many years of study of their distribution, morphology and cytogenetics. Present distribution of all species of the genus, mapped and interpreted in the light of the geologic history of the Americas, Antarctica and Australasia, is shown to correlate with other fundamental evidence of their phyletic evolution. A living collection of fifty-six of the sixty recognized species and of numerous varieties and forms has permitted comprehensive studies of comparative morphology and cytology which have contributed significantly to documentation of the author's phyletic conclusions. In the section on cytology karyotypes of all but four species and complete meiotic sequences in representative species and hybrids are illustrated. The living collection has also made possible extensive hybridization involving almost every species. Meiotic chromosome behavior in over two hundred F_1 interspecific hybrids, representing intersectional or intersubgeneric, as well as intrasectional combinations, has been analyzed and tabulated and in many cases illustrated. The combined evidence points to evolution of the genus via amphiploidy superimposed upon amphiploidy with introgressive hybridization and chromosome reorganization contributing largely to genetic differentiation on each successive amphiploid level. The complete evolutionary picture is presented in charts showing the derivation of each of the sixty species. — Part VI (with H.-M. WHEELER and P. C. HUTCHISON, Sr. Botanists, Botanical Garden, University of California, Berkeley) is a taxonomic reorganization of the genus.

EUPHYTICA

NETHERLANDS JOURNAL OF PLANT BREEDING

VOL. 4 No. 3

OCTOBER 1955

p. 197-264

This new edition of ROEMER-RUDOLF's *Handbuch der Pflanzenzüchtung* published in 38 monthly issues comprising six volumes, viz. Vol. 1: Principles of plant breeding; Vol. 2: Breeding of cereals and maize; Vol. 3: Breeding of potatoes and root crops; Vol. 4: Breeding of fodder crops; Vol. 5: Breeding of special crops (oleaginous, albuminous and fibrous plants, spices and drugs); Vol. 6: Breeding of fruits, vegetables, viny and forest tree plants.

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*To Goodspeed:
I thought you might be interested in this
review.
Mullen*

Biologisches Zentralblatt Bd. 76(1), 1957

Goodspeed, Thomas Harper, The Genus *Nicotiana*. (Volume 16 of the serial *Chronica Botanica*).
Format 16 × 25, 536 Seiten, 118 Abbildungen. Waltham, Mass., USA, 1954. *Chronica Botanica* Co. Berlin-Charlottenburg: R. Friedländer & Sohn. Preis: geb. \$ 12,50.

Die vorliegende Monographie ist das Ergebnis einer mehr als 30jährigen Arbeit, die Thomas H. GOODSPEED, Direktor des Botanischen Gartens der Universität von California, zusammen mit einem vielseitig orientierten Stab von Mitarbeitern auf die Gattung *Nicotiana* verwandt hat. Der Schwerpunkt des Werkes wird durch die vorbildliche Behandlung der cytologischen und gene-

tischen Verhältnisse bestimmt, die zusammen mit der gründlichen Darstellung der Verbreitung und Morphologie die Grundlage zu einer modernen cytotaxonomischen Konzeption der gesamten Gattung abgibt. So liegt der Schlüssel zu dieser Grundauffassung in den Abschnitten, die „die Cytologie der Arten“ und „die Cytologie der F₁-Artbastarde“ behandeln. Im einzelnen werden dabei in übersichtlicher und leicht verständlicher Form solche cytologischen Gesichtspunkte berücksichtigt, die besonders für den Systematiker von Wert sein dürften, wie z. B. „Chromosomenzahl und -form“, „Die Cytologie der Fortpflanzung“ und das Auftreten von „Euploidie, Aneuploidie und Amphiploidie“. Ein Kapitel „Kategorien der meiotischen Paarung und des Meiose-Ablaufs“ legt die Ordnungsprinzipien dar, nach denen „die Natur und Bedeutung des Metaphase-I-Verhaltens“ bei Artbastarden systematisch gewertet wird. Aus diesen Untersuchungen entwickeln sich die Vorstellungen über die Phylogenie der Gattung, wobei besonders die Bedeutung cyto-genetischer Mechanismen für die Entstehung und Evolution der Species herausgestellt wird. Die Quintessenz der phylogenetischen Erörterungen bildet eine interessante Spekulation über „die Zukunft der Gattung“. GOODSPEED vertritt dabei die Ansicht: „In general, however, the genus may be expected to expand both genetically and geographically, with greatest increase in number of species on the higher polyploid level“ (S. 319). Eine ausführliche taxonomisch-nomenklatorische Aufstellung der 60 Species und ihrer Varietäten, gemeinsam bearbeitet von GOODSPEED, H., M. WHEELER und P. C. HUTCHISON, beschließt das wertvolle Werk, das in überzeugender Weise zeigt, welche interessanten Entwicklungsmöglichkeiten der ältesten biologischen Disziplin, der Systematik, offen stehen, sobald aus der Herbar-Systematik eine, durch das genetische Experiment ergänzte Cyto-Taxonomie wird. F. MECHTELKE (Gatersleben)

- Catalogue of Insecticides and Fungicides** by D. E. H. FREAR (Ann.Crypt. 7 & 8). Over 10,000 chemicals, plant species, and miscellaneous materials, which have been tested for the control of insects and plant diseases, are listed separately, with chemical names, synonyms, and complete formulas. The results of the insect and fungus tests, and one or more literature citations are given for each material. Contains many unpublished data contributed by cooperating industrial and private testing laboratories. Eliminates laborious literature and patent research \$12.00
Volume I: Chemical Insecticides. Condensation products. Miscellaneous insecticides. Patent index by countries of origin and by number. Author index and literature references. \$6.50
Volume II: Chemical fungicides. Condensation products. Plants tested as fungicides. Miscellaneous fungicides. Plants tested as insecticides. Patent index by countries of origin and number. Author index and literature references. \$5.50
- The Genus *Bazzania* in Central and South America** by M. FULFORD (Ann.Crypt. 3). Revision of a difficult liverwort genus \$5.00
- The Genus *Nicotiana*** by T. H. GOODSPEED (C.B. 16). A distinguished memoir on the origins, relationships and evolution of the current species of a representative genus of flowering plants in the light of the distribution, morphology and cytogenetics of *Nicotiana*. With a complete taxonomic revision of the genus by T. H. GOODSPEED, H-M. WHEELER and P. C. HUTCHISON. Not "another book on tobacco" and related species but a classic study of speciation and phyletic in plants \$12.50
 "A much needed and welcome compilation of a wealth of world literature and a lifetime of research . . . will take its place among such classics as . . . admirable publishing skill is exhibited in the numerous excellent illustrations and pleasing format of the book" (Science).
 "Must secure its place among the various monographs which have been appearing of recent years, and in which the technique of genetics and cytology have been added to the older methods of study to give us a broader basis for our taxonomic and evolutionary judgments. Reference to it can hardly be avoided by anyone interested in the newer taxonomy or in the genus *Nicotiana*" (*Horticultural Abstracts*).
- Nuttall's Travels into the Old Northwest** by J. E. GRAUSTEIN (C.B. 14,1/2). Unpublished diary made by the noted botanist on his famous expedition up the Missouri (1810). Well annotated \$3.00
- Families of Dicotyledons** by A. GUNDERSEN (N.S.Pl.Sc.Bks. 25). The concise, original scheme which the author employed in describing the families enabled him to present more information than one would expect in such a relatively small and inexpensive book. Specialists contributed chapters on fossil dicotyledons, wood anatomy, carpels & ovules, embryology, cytology, and plant geography. The first original publication, covering this subject, since RENDLE's and HUTCHINSON's books \$5.00
- The Inorganic Nutrition of Plants** by D. R. HOAGLAND (N.S.Pl.Sc.Bks. 14). These Prather Lectures at Harvard University deal particularly with soil-plant interrelations, nutrient absorption and utilization, and artificial culture methods \$5.00
- Principles of Fungicidal Action** by J. G. HORSFALL (N.S.Pl.Sc.Bks. 30). An entirely new book on the mechanisms of fungicidal action, rather than a revised edition of the author's *Fungicides and their Action* (1945). Describes the physics and chemistry of protection and the mechanisms of fungitoxicity underlying successful protection. Strives to distinguish at all points between permeation and inherent toxicity.—"Invaluable both as a text and reference . . ." (*Antibiotics and Chemotherapy*) \$6.50
- Luther Burbank** by W. L. HOWARD (C.B. 9,5/6). An authoritative biography of the controversial horticulturist with an account of the almost eight hundred varieties he produced or sent out \$3.75

2192. GOODSPEED, THOMAS HARPER. (U. California, Berkeley.) The genus *Nicotiana*. Origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics. *Chronica Botanica* 16(1/6): xxii-536. Illus. Maps. 1954. Cloth bound edition, \$12.50. Chronica Botanica Co., Waltham, Mass.--This monograph is divided into 6 parts; the 1st contains chapters on the distribution of the genus in the world (60 spp.), in North America (9 spp.), in South America (36 spp.), and in Australia and the South Pacific (15 spp.). The origin of the genus is believed to be in South America, in Lower Eocene, with subsequent dispersal to other regions: to North America via the Panama isthmus and to Australia and the Pacific isles via Antarctica. The 2nd part covers general morphology, comparative anatomy of the spp., and the occurrence and distribution of trichomes, and their phyletic significance. In part 3 are found data on chromosome number (12 pairs or multiples of 12 are characteristic of about 2/3 of the spp.) and morphology (polymorphic in many spp.), cytology of reproduction, euploidy, aneuploidy, and amphiploidy. Then follows a section on meiotic sequences and the 5 categories of pairing. The nature and significance of MI pairing in intra- and intersectional hybrids is discussed. The evidence given in 12 chapters is then interpreted and the evolutionary background of the genus is postulated, together with the cytogenetic mechanisms responsible for the origin and evolution of modern spp. Amphiploidy and genetic differentiation (including mutation, chromosome alteration, and hybridization) are thought to account for attainment of specific rank. The future of *Nicotiana* is assured because of the predilection of spp. for disturbed soil--a characteristic of man-made habitats. The final third of the book (169p.) deals with taxonomy. This includes an historical résumé (1507-1953), a list of 50 herbaria consulted, a genus description, and keys, plus descriptions, to the 3 subgenera, 14 sections, 60 spp. and 20 vars. An additional 45 spp. or vars. are listed as insufficiently known, 13 as excluded, and 5 as hybrids. Literature citations number 396.--T. Kommedahl.

Biol. Abstracts (Jan. 1957)