

Aut. Intell. Feb. 3/78

Man-of-the-Year Reviews Changes In City's Scene

By BARRY GRILLS
(Staff Reporter)

(Belleville today is a changing scene. As a prelude to the 1969 Citizen of the Year Award, The Intelligencer is reviewing award-winners of earlier years as a source comment on that change.)

George Wishart, Belleville's

Citizen of the Year award recipient, is a man of philosophical principles, principles that have made him a force in community life.

And the first among those principles is his personal concern concerning the difference between quantity and quality.

All of my activities have been directed towards quality, he said. "It's not size counts, but quality that makes the difference. My interest has been towards a better quality of life."

Wishart came to Belleville in 1929 and has lived on Main Street ever since. He was employed at the Federal Research Institute for 35

years.

But he was not one of those who sits before the television set after his working day is done.

In 1958 he was elected to Belleville city council and he served as an alderman for six years. He was on the Children's Aid Society board for eight years.

Mr. Wishart also was on the board of governors of the Belleville General Hospital and spent 25 years working for the Canadian National Institute for the Blind.

He also served on the board of education for 13 years and is proud of the times when he knew all the teachers well and many of the students.

But it is his work on the Moira River Conservation Authority of which he is most proud.

"Conservation was dearest to my heart," he said. "I've had experience at the lab and the (research institute) is about conservation."

After his election to city council, Mr. Wishart was vot-

ed by council to be a member of the Moira River Conservation Authority — much to his delight.

His major project while on council and on the Authority was an attempt to get the city to build an ice-control dam on the Moira River to alleviate the threat of flooding in the city.

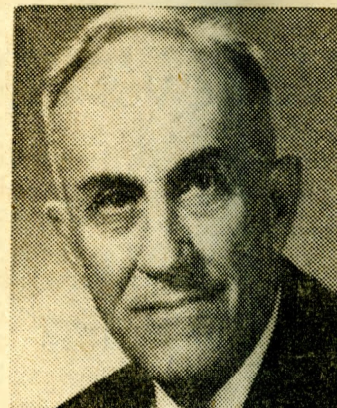
He recalled that engineers had been obtained and that a 30-foot model was constructed.

As a result, the city passed a resolution at first to build the dam if it could receive a grant to pay for 75 per cent of the building costs.

On that basis Mr. Wishart went to Ottawa, but finally after two meetings with federal authorities, the government refused to assist the city with the dam because the project was too small.

Still undefeated, Mr. Wishart issued a questionnaire to Belleville area citizens living on the Moira River's flood plain to see if they would finance its construction.

The majority of the citizens



GEORGE WISHART

questioned felt that they would not because it was too expensive.

Mr. Wishart remembers the flood of 1936 in Belleville and feels that "we've been lucky so far."

Even recently his work with conservation and the authority has not ceased. Last year he and his wife worked at O'Hara's Mill as volunteers — "pure donkey work".

It has been four years since his receipt of the Citizen of the Year Award and Mr. Wishart has noted a number of changes in Belleville since that time.

"One of the things I note is the great deal being done in culture of all kinds," he said. "This is one of the most significant things — and our parks."

"It's fantastic what they're doing for the kids," he added.

His only word of caution is towards industrial growth. "I'm not against industry, but we shouldn't try to digest it too fast."

George Wishart retired on December 28th, 1961, after 35 years' service. He was born in the village of Carp in the Ottawa Valley and, though many years have passed since he lived there, he can still pronounce the name of his birth place with the correct Ottawa Valley accent.

After graduation from the Arnprior High School in 1915, he obtained a teacher's certificate at the Ottawa Normal School and taught in Ottawa Valley schools until 1920. He entered the Ontario Agricultural College in 1920 and specialized in entomology. He took an active part in campus activities, notably the Philharmonic Society of which he was an executive member and choir manager.



During the summers of 1922 and 1923 he was employed by the Ontario Department of Agriculture. After graduation in 1924 he was employed for a year by the United States Department of Agriculture, but was forced to resign because of illness. In 1927 he was appointed to the staff of the Entomology Laboratory at Chatham, Ont., to investigate the biological control of the European corn borer. In 1934-35 he worked toward a Master's degree at Macdonald College.

In 1929 the laboratory staff was moved from Chatham to Belleville, where Mr. Wishart was made responsible for all biological control projects on field crop and garden insects. He developed special equipment and techniques for the propagation of parasites, host insects and host plants. A constant temperature-humidity cabinet that he designed became standard equipment in Government and many Canadian university laboratories. Mr. Wishart also played a major role in the design of air-conditioning and other specialized equipment in the quarantine laboratory constructed at Belleville in 1935 for research on potential biological control agents. The successful biological control of several species of insect pests can be directly attributed to the research work of Mr. Wishart and his assistants.

In 1956 the organization and functions of the Belleville Laboratory were changed and Mr. Wishart entered a new and challenging field of research, the responses of insects to sound. It is a tribute to his ability and versatility that, in the relatively short time since initiation of this work, he has received international recognition for the published results of his research.

Mr. Wishart's contribution to Canadian agriculture did not prevent him from taking an active interest in community affairs. He was an appointed member of the Vocational Advisory Committee of the Belleville Board of Education from 1942 to 1944, an elected member of the Board from 1945 to 1952, and Chairman in 1947. In 1952 the Belleville Board of Education was replaced by the Bay of Quinte High School Board. Mr. Wishart remained an elected member of this Board until 1957 and was Chairman in 1954. In 1957 he resigned from this post when he was elected an alderman of the City of Belleville, a position which he still occupies. He has been an active member of the Institute for the Blind for twenty years and has held all executive offices in that organization. He was elected to the local Children's Aid Society in 1958 and is at present the Vice-President. He was appointed to the Moira River Conservation Authority in 1958 and is now the Vice-Chairman of the Authority. He is also a member of the Belleville General Hospital Board and a Director of the Belleville and District Fish and Game Association.

In 1929 Mr. Wishart married Lois Keatley of Montreal. They have three daughters: Lois Mary, Mrs. John O. Graham, Richmond Hill; Elspeth, Mrs. C.J. Menendez, Ottawa; and Carol, Combines Investigations Branch, Department of Justice, Ottawa.

On December 16th, 1961, Mr. Wishart and his family were honoured at a dinner party in Hotel Quinte, at which time he was presented with a projector. Mrs. Wishart resides at 154 Dufferin Avenue, Belleville. George also lives there when he is not attending meetings of boards, institutes, commissions, etc.

J. H. McLeod

ENTOMOLOGICAL SOCIETY OF CANADA

Bulletin



VOLUME 2

NUMBER 1



ENTOMOLOGICAL SOCIETY OF CANADA

1969-1970

President: E. J. LeRoux

Secretary: D. G. Peterson

President-elect: W. F. Baldwin

Treasurer: E. C. Becker

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Editor: D. P. Pielou

PAGINATION CHANGE

For convenience in future referencing, a system of annual volumes is being adopted, within volumes, pagination will be continuous. Numbers one and two, with pages numbered separately, will constitute volume one; this number starts volume two.

Editorial

At their mid-winter meeting held at Ottawa in late January, the Board of Directors decided that printing of the Bulletin should be arranged by the Bulletin editor, rather than by the Ottawa editorial office. They hoped to facilitate communication with the printer and lessen delays in publication. A change of printer means different methods and an obvious change of style. Hopefully you approve of the changes. Fledging isn't easy, and more changes may be necessary before a final plumage pattern evolves and we get truly airborne.

EDITORIAL BIAS

A serious hazard in publishing a bulletin like this one, is that its coverage may be biased in favor of the location of its editorial offices. The Entomology Division Newsletter suffered this criticism, and the CBC still does. It's easy to just pick up the phone and call the local people — something has to be done when there is an empty space and nothing to fill it. Prevent regional bias, and send in news. If you have a pet idea or peeve, don't keep it in your coffee club — bring it out. Tell us the rationale of your scientific approach, politick a little, build an empire, or even get cut down. If you've just completed a sabbatical, a secondment, or a WHO assignment, give us your impressions.

CORRESPONDENTS

Since the last issue of the Bulletin a grapevine of correspondents has been set up across the country. All establishments with concentrations of entomologists have not yet got one, but it is hoped they soon will.

Because there are so many, it is not possible to write regularly to every correspondent. It is therefore hoped that we can keep them informed through the Bulletin.

Correspondents may send in material at any time, but the deadline for the next issue is 15 May. It would be appreciated if these were edited and typed as well as possible to save work at this end. Please provide good glossy prints of the finished size of any photographs you submit, because we do not have graphic facilities available to us here. Probably of more importance than news gathering, correspondents should watch for potential lead articles and solicit them. Contributions in French are welcome.

Would any correspondent who feels he cannot continue, please designate a successor.

Contributions and correspondence should be sent to: D. C. Eidt, Editor, Bulletin of the Entomological Society of Canada, P. O. Box 4000, Fredericton, N. B.

LETTER TO THE EDITOR

Sir:

Bull. Ent. Soc. Can. No. 2 came today. I should like to compliment you and the Society on its existence and its quality.

However, I should like further to suggest regarding the excellent SEMicrograph (p. 24) that data be given regarding the instrument used and the conditions of preparation. I suspect it was a Stereoscan but I believe it important to know if it was metal coated — consider the elegant SEMicrograph on the cover of *Science* for 9 Jan. 70 which was not coated!

Also I would reply to Dr. Vickery (pp. 20-21) that the amateur entomologist is not a vanishing breed. I am one, I am, as is A. C. Sheppard, a charter member of the Lepidopterist's Soc., and I have had several insects named for me — including a Crambid by Klots.

I suggest, and have done so before, that progress in taxonomy might be assisted if the available supply of taxonomists were more conditioned to a willingness to do taxonomy and less strongly motivated also to do the biology and bionomics of their animals. This is the area in which I feel that the amateur can be of greatest service — he can look at the beasts in his area, collect them, forward them to the taxonomist, and thus aid the advancement of knowledge.

Bryant Mather
Box 631
Vicksburg, Miss. 39180, U.S.A.

Drs. Seabrook and Wilkes produced their scanning electron photomicrograph on a Cambridge Stereoscan. Fresh material, not freeze-dried was given a double coating of gold. — Ed.

NEW LABORATORY BUILDING OPENED

The new Canada Department of Agriculture Research Laboratory at Harrow was officially opened on November 7, 1969 by the Honourable Arthur Laing, Minister of Public Works for Canada, and the Honourable H. A. Olson, Minister of Agriculture for Canada. Over 400 invited guests witnessed the ceremonies and toured the building. A very successful open house for the public was held on the succeeding Saturday and Sunday.

The laboratory complex includes a two-storey research building interconnected with a single storey administrative wing and three service wings. Specialized facilities are provided for soil science and irrigation, plant physiology and biochemistry, weed science, plant breeding and genetics, plant pathology, entomology and nematology. This complexity of research facilities is in keeping with the requirements of the extensive and diversified nature of agriculture in southwestern Ontario.

W. H. Foott



OUR FILE NO. 19-5-4-1-2
NOTRE DOSSIER NO

YOUR FILE NO.
VOTRE DOSSIER NO.

DEPARTMENT OF FISHERIES AND FORESTRY
CANADIAN FORESTRY SERVICE

MINISTÈRE DES PÊCHES ET DES FORÊTS
LE SERVICE CANADIEN DES FORÊTS

CHEMICAL CONTROL RESEARCH INSTITUTE
25 PICKERING PLACE
DUSTBANE BUILDING
OTTAWA 8, ONT.

To whom it may be of interest.

6th February, 1970.

Re: DDT Residue in Humans.

At the time of a recent minor operation, I had a sample of abdominal fat removed for the purpose of determining the presence of DDT and DDT breakdown products. I have been inordinately exposed to DDT since its first use in Canada in 1944, and I would guess that my exposure would be several hundred times that of an average citizen of Toronto.

The following shows the results of analysis of my tissue and for comparison there is no significant difference between these results and those from 50 (unfortunately deceased) citizens of Toronto. It appears the theory that a threshold of retention is soon reached and further exposure does not accumulate is probably valid, at least for abdominal fat.

Analyst -

Mr. W.R. Ritcey,
Food and Drug Directorate,
Division of Food Chemistry,
Department of Health and Welfare.

Sample of J.J. Fettes' abdominal fat:-

pp' DDE	4.10 ppm
pp' DDT	1.60 ppm
op' DDT	0.11 ppm
pp' DDD	0.07 ppm
Dieldrin	0.19 ppm
Heptachlor epoxide	0.04 ppm

James J. Fettes
Director.

JJF/jd

CANADIAN ENTOMOLOGIST 100 YEARS AGO

A society that is unaware of its own history is a society in difficulty. Hegel said something like that but the wisdom of the statement is often forgotten. To us the writings in the Canadian Entomologist of 100 years ago may sound funny, or stilted, or full of trivia, but look back and be amused, enjoy the eloquent style, see how we have progressed, see what we have lost, see what the men who laid the foundations of Canadian entomology were like. The entomologists of 100 years ago had quite a different outlook from that of the entomologists of today, and felt a stronger kinship with nature. Editors too were of a different breed, and permitted an individuality of style unheard of now. The changes themselves are not important; consider what they mean in terms of changing philosophy.

Consider the following editorial, and in view of "cost-benefit analysis" and "mission orientation", see how it relates to 1970.

To-day our Society enters with the New Year upon a new phase of existence. Hitherto it has been entirely dependant upon the unaided contributions and voluntary assistance of its members, who, in the very nature of things, are comparatively few in number, and scattered over a wide area of country; now it has received official recognition, and is furnished with such pecuniary aid as will enable it to carry out more effectually the work that it was intended to perform. We trust, then, that all our members will now bestir themselves, and work zealously and actively for the cause of Entomology in this country, and will show by their labours that the encouragement afforded them has been usefully and worthily bestowed. We have now made our first moult, but still continue in a larval state, with all a caterpillar's voracity for food; unless we get plenty we shall shrivel up and die. The sustenance that we require is more members, more work, more books, more specimens, more scientific contributions, more subscribers to our journal, more active co-operation on the part of all!

The author was probably the Rev. C. J. S. Bethune, who was editor in 1870. The pecuniary aid referred to was a grant of \$400 from the Council of the Agriculture and Arts Association of Ontario "on the condition that the Society furnish an Annual Report, and form a Cabinet of Insects useful or prejudicial to Agriculture and Horticulture, to be placed at the disposal of the Council, and that they also continue to publish their Journal." The report became the Annual Report of the Entomological Society of Ontario, and the "Cabinet of Insects" is housed at OAC where it continues to grow and serve students of entomology.

Now, latter day entomologists, with your electron microscopes, radioactive isotopes and computers, can you solve this problem?

A SINGULAR CASE

Seeing in the last number of the Canadian Entomologist, a description of the eggs of *A. Luna*, reminds me to ask of you the explanation of a curious circumstance in the life-history of one bred by me from the larva last year. I will

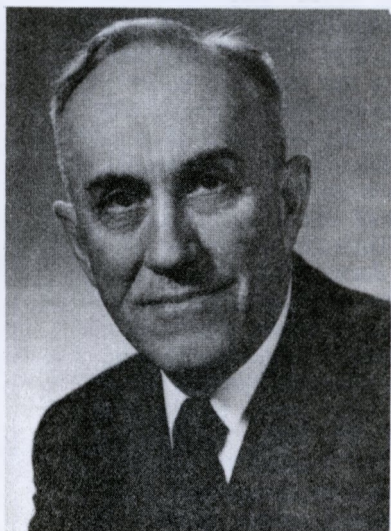
premise that I am writing without my notes, and therefore cannot give figures accurately, but can give the facts. There may be nothing very strange about it, but two of the best entomologists in the United States inform me that it is entirely new to them. It is this:— Some time in the latter part of the summer of 1868 I took, feeding on walnut leaves, a mature larva of *A. Luna*; from which I did not hope to rear the mature insect, because I counted on the larva over twenty eggs like those of a *Tachina*. Underneath some of these eggs I could discern with a lens a minute opening through which the fly-larva had entered the body of the *Luna* larva. The skin of the latter was more or less discoloured under each egg, but under some — under many in fact — there was a dense black spot, sometimes two lines in diameter. I made a slight incision in the skin of the *Luna* larva at the place where a *Tachina* larva seemed to have entered by one of the little holes, to see if I could find the *Tachina* larva. It was a very slight incision, as I did not wish to kill the *Luna* larva, but wanted to rear the flies from it to see if they were the same as those bred from *Saturnia lo*. Before it spun up it changed colour, becoming almost pink. It spun up, and to my surprise, instead of producing *Tachinae*, there last spring emerged from it an unusually large *Luna*. The question which puzzles me is, what became of the parasites? According to all the books, I believe, the entrance of the parasite into the body of its proper host is certain death. Could it have been that the parent *Tachina* made a mistake, and that its progeny, not finding the *Luna* to their taste, died or made their escape? Even if they had died inside the *Luna* larva, must they not have occasioned its death, especially considering the number of them?

I will add that there was no possibility of a mistake, as I had but one other *Luna* larva (and it had spun up before I found the infested one, and like it produced a perfect moth, though not so large as that from the infested one), and these were the only two *Luna* larvae and the only two *Luna* moths that I ever saw. I still have both. The infested larva was the last to spin up, but the first to emerge. Can you tell me what became of the *Tachinae*?

V. T. Chambers, Covington, Ky.

P.S. — Since the above was written, I have referred to my journal, and find that the first larva was taken on Sept. 2; the infested one on Sept. 4. The latter came out on May 6th, and the former on May 15th. Otherwise the facts are as above stated. — V.T.C.

Having had these samples, we intend to publish more to leaven the pages of future issues of the Bulletin. We hope you enjoy them.



In Memoriam

GEORGE WISHART

1896-1970

Canada has lost a prominent entomologist, conservationist, and community leader with the death of George Wishart in his 74th year, on the 23 February 1970 at the Belleville General Hospital. Though he had suffered from a heart condition for sometime, his last illness was brief.

Mr. Wishart was born at Carp, Ontario, a son of the late Mr. and Mrs. Alexander Wishart, and received his early education in that district. After graduating from the Arnprior High School in 1915, he obtained a teacher's certificate at the Ottawa Normal School and taught in Ottawa Valley schools until 1920, when

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During his entomological career, George Wishart was the author or co-author of 31 scientific papers published mainly in the *Canadian Entomologist* and the *Proceedings of the Entomological Society of Ontario*. He was a member of both the Entomological Society of Canada and of the Entomological Society of Ontario and was elected to the directorship of the latter Society

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With conservation a subject uppermost in his mind, George Wishart was appointed to the Moira River Conservation Authority in 1958 and worked long and arduously both as a member and as its Chairman for several years. He was also a member of the Soil Conservation Society of America.

Besides his contribution to Canadian agriculture and conservation, Mr. Wishart found time to participate actively in community affairs. He helped to guide the education of the Belleville and District youth by serving as an appointed member of the Vocational Advisory Committee of the Belleville Board of Education from 1942-1944; as an elected member of this Board from 1945 to 1952 and as its Chairman in 1947; and as an elected member of the Quinte High School Board from 1952-1957 and as its Chairman in 1954.

In 1957, George resigned from this post when he was elected an alderman of the City of Belleville, a position which he held for 6 years. While an alderman he was appointed to the Belleville General Hospital Board of Governors by City Council and served for some years in this capacity. In 1958, he was elected a Director of the Belleville Children's Aid Society, one of his pet projects, and held offices on its executive. Mr. Wishart was an active member of the Canadian National Institute for the Blind for over 25 years, for which he received a special citation in 1968, and held all executive offices on the Hastings County Advisory Board of this organization, including being its Chairman for a number of terms. A member of Bridge Street United Church, Belleville, he was active in Church work and sang in its choir for some years. For service to his community, the Belleville Jaycees named him Citizen of the Year in 1965.

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To his friends, age was not a barrier. He will be missed and long remembered by the many children, youths, and adults who valued his friendship, gained much from his knowledge, and received solace, guidance and understanding from him in time of need.

George Wishart is survived by his wife, Lois Christina Keatley, of Montreal whom he married in 1929, three daughters (Lois Mary, Elspeth Ann. and Carol Emily) and five grandchildren. Also surviving are one brother, Jack, of Arnprior and an adopted sister, Margaret (Mrs. Ralph Johnstone), of Montreal.

Joan F. Bronskill

of the Entomological Society of Canada
Bulletin

March, 1970

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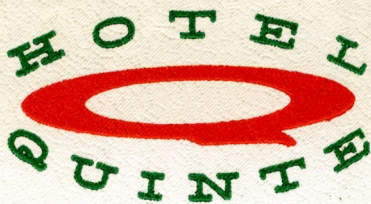
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Joan F. Bronskill



Souvenir Banquet Menu

GEORGE WISHART, B.A., M.A.

RETIREMENT PARTY

ENTOMOLOGICAL RESEARCH INSTITUTE

BELLEVILLE, ONTARIO

16 DECEMBER, 1961

BUFFET DINNER MENU

BUTTERED FRENCH STICK

ROAST PRIME BEEF CARVED TO ORDER

FONDANTE POTATOES
IN CHAFING DISH

COLD SWEET PICKLED HAM

ASSORTED COLD MEATS

SPANISH RICE WITH SHRIMP

POTATO SALAD

VEGETABLE ASPIC

GREEN BEANS ANGLAISE

TOMATO ASPIC

PETIT FOURS

COFFEE

Paul Sishart

THE SEVENTIETH ANNUAL MEETING

of the

Entomological Society of Ontario

Royal Ontario Museum
Toronto, Canada.

THURSDAY and FRIDAY
November 23rd and 24th
1933

All regular meetings will be held in the
Theatre of the Royal Ontario Museum.

All meetings are open to the public. Anyone
interested in any phase of insect life is
cordially invited to attend and take part in the
discussions.

The attention of the public is particularly
directed to the special public address on
Thursday evening

"INSECT MUSICIANS"

By Dr. E. M. Walker
University of Toronto

Dr. W. H. Brittain
President

Mr. R. H. Ozburn
Secretary

Members of the Local Committee

Dr. E. M. Walker, Mr. J. E. Dymond, Mr. F. P. Ide,
Mr. W. A. Fowler.

During the course of the meetings parking space at the rear of the Royal Ontario Museum will be available to the members and friends of the Society - entrance from Queen's Park Crescent.

Arrangements have been made for those attending the meetings to have luncheon and dinner in the Graduate Dining Room, Hart House.

Owing to the C.S.T.A. banquet Friday evening, no arrangements have been made for the usual Smoker. During the Friday meetings an announcement will be made for the benefit of those not attending the banquet.

The following will be included with the Friday Morning papers:-

"The Grasshopper Campaign in Manitoba in 1933" -
R. H. Painter, Entomological Branch, Ottawa.

PROGRAMME

Thursday Morning, November 23rd, 1933

10.45 o'clock - Meeting of Council - Lecture Room, 5th Floor, Royal Ontario Museum.

Thursday Afternoon, 2.00 o'clock

General Business Meeting:

Reports of Council, Treasurer, Librarian, Branch Societies and Delegate to the Royal Society.

Election of the Committees on Nominations and Resolutions.

"Japanese Beetle" - L.H. Worthley, U. S. Department of Agriculture (in charge of Japanese Beetle and Corn Borer Quarantine).

"The European Corn Borer Situation in Ontario in 1933" - L. Caesar, Ontario Agricultural College, Guelph, Ontario.

"The Corn Borer Situation in Quebec" - Georges Maheux, Department of Agriculture, Quebec.

"Further Observations on the Flight of the European Corn Borer" - G. M. Stirrett, G. Beall and W. E. Lindsay, Entomological Laboratory, Chatham, Ontario.

"The Value of Histological Studies in Parasite Propagation, with Special Reference to *Chelonus annulipes*, a Parasite of the European Corn Borer" - G. Wishart and W. E. van Steenburgh, Entomological Branch, Parasite Laboratory, Belleville, Ontario.

"Bat Bugs and Bed Bugs" - J. R. Dymond, Department of Biology, University of Toronto, Ontario.

"Some Notes on the Praying Mantis" - C. B. Hutchings,
Entomological Branch, Ottawa.

"A Review of Entomology as presented by the Daily and
Weekly Press of Canada" - H. A. Gilbert, Entomolog-
ical Branch, Ottawa.

Thursday Evening, 8.15 o'clock

Theatre of the Royal Ontario Museum

"INSECT MUSICIANS"

Dr. E. M. Walker
Department of Biology, University of
Toronto.

Friday Morning, 9.00 o'clock

"Three Years' Experience with Moth Traps" - H. F.
Hudson, Entomological Laboratory, Strathroy,
Ontario.

"Description of a New Light Trap" - J. J. de Gryse,
Entomological Branch, Ottawa.

"The Biology and Habits of the Gladiolus Thrips in
Ontario" - Alan G. Distan, P. I. Bryce and W. G.
Matthewman, Entomological Branch, Ottawa.

"The Inspection for Apple Maggot in Ontario in 1933" -
W. N. Keenan, Entomological Branch, Ottawa.

"The Economic Insect Fauna of a Niagara Peach Orchard" -
Wm. A. Ross and Wm. Putman, Entomological Laboratory,
Vineland Station, Ontario.

"Apple Leaf Rollers in Ontario" - J. A. Hall,
Entomological Laboratory, Simcoe, Ontario.

"Dimorphism in the Females of *Somatochlora franklini*" -
Dr. E. M. Walker, Biological Department, University
of Toronto.

"A Gynandromorph Occurring in Mayflies" - F. P. Ide,
Department of Biology, University of Toronto.

"Unusual Nesting Site of Solitary Bee" - Arthur Gibson,
Dominion Entomologist, Entomological Branch, Ottawa.

"The Grasshopper Situation in Western Canada" - H. G.
Crawford, Entomological Branch, Ottawa.

"On Estimating Grasshopper Populations on Ranges" -
G. J. Spencer, University of British Columbia,
Vancouver, B.C.

"Notes on the Grasshopper Campaign in Manitoba in
1933" - A. V. Mitchener, Manitoba Agricultural
College, Winnipeg, Manitoba.

Friday Afternoon, 2 o'clock

"A Preliminary Report of the Control of the Tarnished
Plant Bug on Celery" - R. W. Thompson, Department
of Entomology, Ontario Agricultural College.

"The Pale Western Cutworm Situation in 1933" - H. G.
Crawford, Entomological Branch, Ottawa.

"The Dermestid, *Trogoderma versicolor* Creutz., A New
Pest of Dried Milk Products" - C. R. Twinn,
Entomological Branch, Ottawa.

"The Dutch Elm Disease Situation in the United States"-
L. S. McLaine, Entomological Branch, Ottawa.

"Notes on the Value of Shallow Ploughing and Discing
in Reducing White Grub Populations" - G. H. Hammond,
Entomological Branch, Ottawa.

"The Outbreak of European Spruce Sawfly in the Gaspé" -
R. E. Balch, L. J. Simpson, M. L. Prebble, Entomological
Branch, Fredericton, N.B.

"The Satin Moth in the Maritimes" - R. E. Balch,
Entomological Branch, Fredericton, N.B.

"Further Observations on the Behaviour of *Wohlfahrtia*
vigil (Walk.) with Notes on the Collecting and Rearing
of the Flies" - Dr. Norma Ford, Department of Biology,
University of Toronto.

"Notes on the Life History of *Grylloblatta campodeiformis*
(Walk.)" - Miss Anna Chorolsky, Department of Biology,
University of Toronto.

"Some Features in the Life Histories of Ontario
Trichoptera" - Miss Jean Fraser, Department of Biology,
University of Toronto.

"Notes on Some of the More Injurious Insects of the
Season 1933 in Canada":

Nova Scotia	Mr. F. C. Gilliatt
New Brunswick	Mr. R. P. Gorham
Quebec	Mr. G. Maheux and Mr. C. E. Petch
Ontario	Prof. L. Caesar and Mr. W. A. Ross
Manitoba..	Prof. A. V. Mitchener and Mr. R.H.Handford
Saskatchewan	Mr. K. M. King
Northern Alberta	Prof. E. H. Strickland
Southern Alberta	Mr. H. I. Seamans
British Columbia	Mr. E. R. Buckell

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SOME DEVICES FOR HANDLING INSECTS

By George Wishart

Dominion Parasite Laboratory,
Belleville, Ontario.

Entomological Branch

ABSTRACT:

The paper deals with new apparatus for handling adult insects by the use of air currents. These have been developed in connection with the breeding and handling of parasitic insects and their hosts at the Dominion Parasite Laboratory, Belleville, Ontario.

SOME DEVICES FOR HANDLING INSECTS

By George Wishart

Dominion Parasite Laboratory, *Entomological Branch,*
Belleville, Ontario.

In rearing large numbers of parasitic insects and their hosts, the handling of the live adults forms a major part of the work. Until recently most of this handling in our laboratory was done with a camels hair brush, the insects being brushed off the cage into a vial or other receptacle. The apparatus described in this paper was devised to reduce the labour involved in this operation, and as far as possible, to eliminate injury to the insects handled.

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name*

In the case of one insect, Microbracon brevicornis, ^{*Wesm.*} it is necessary to place three or four adults of each sex in a small Stender jar. To fill a few hundred jars from a cage containing thousands of active adults by the old method was a patience-trying task and usually fatal to many of the flies. The device shown in Figure 1. has greatly reduced the labour involved in this operation. It consists of a small piece of glass tubing shaped into a nozzle and having a screen placed

at a convenient distance from the opening. This is connected by about 18 inches of rubber tubing to an ordinary large pipe stem. To operate, the pipe stem is held in the mouth and the glass tube in the hand, the open end of the tube is held near the insect to be caught and the breath drawn in. The suction thus created draws the insect into the tube and the screen prevents it from being drawn into the mouth. When the desired number of insects have been caught and it is desired to release them the open end of the tube is placed where they are wanted and they are expelled by blowing gently. ^{through the tubing.} ~~where the insects are small,~~ large numbers may be handled by this method without any appreciable fatigue to the operator. In nearly three years use with the species mentioned no injury to the insects has been noted ^{was} when the apparatus is used with reasonable care. This type of apparatus has been suited to insects of various sizes by changing the size of the nozzle, but with the larger forms its continued use becomes tiring ^{to the operator} due to the greater amount of ~~draft~~ ^{air} required.

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For handling small *Lepidoptera*, the presence of wing scales prohibits the use of the apparatus in this form. To make possible its use, a small filter (Figure 2) is inserted in the line of ^{the} rubber tubing.

add author name
 This is made from a two inch salve box. A piece of metal tubing is fastened to the top and bottom of the salve box and a piece of fine silk which acts as the filtering agent is held between these by a metal ring. In handling moths similar in size to the Oriental Peach Moth (Laspeyresia molesta)^{Busch} it was found that the hole in a pipe stem is not large enough to allow sufficient suction and a mouth piece of hard wood was made, which has proven to be satisfactory. Modifications in the position of the screen and the size of the nozzle may be made to suit individual requirements. One worker using this apparatus reports handling over 600 adults of the Oriental Peach Moth in one day, with very little fatigue and no irritation at all to the throat and lungs.

also
 Another piece of apparatus (Figure 3) operated by hand was^{also} devised for handling Lepidoptera. The nozzle of this is essentially the same as that of the former and is attached to the rest of the apparatus by about 2 feet of rubber tubing. The rubber bulbs are those commonly used on atomizers. The one remote from the nozzle has the valves reversed so that instead of blowing, it always sucks when pressed and released. The other bulb has no valves and when the sucking bulb is being used acts only as a tube. In use, the bulb which has valves is pressed and the nozzle placed near the insect to be

collected, and when the pressure is released, the suction thus created draws the moth into the tube. To expel it the other bulb is pressed quickly. When this is done some air escapes through the sucking bulb but enough is forced out through the nozzle to expel the moths.

where numbers of fairly large insects are to be handled, the use of the breath as a source of draft becomes impracticable and some mechanical ^{method} source must be used. Where vacuum and compressed air are piped throughout the laboratory the problem is simple, requiring only a simple two way valve attached to a collecting nozzle. In the ^{Buller's} laboratory where these devices are being used such facilities are not available and use was made of the only mechanical source of draft viz. an ordinary vacuum cleaner. This provides both suction and draft but does not allow for either being cut off while the other is being used. That is, while the machine is being used for sucking purposes, the blowing opening of the cleaner must be open to the outside and vice versa. The apparatus shown in Figure 4. provides for this. With the exception of the catching nozzle and the spring, all parts are of brass. The rubber tubing on the right connects with the suction opening of the cleaner and the tube on the left with the blowing opening, the place which is usually occupied by the dust bag. Two lines each eight feet long of three-eighths

rubber tubing are used to connect the collector to the cleaner; these are bound together with adhesive tape to prevent them being in the way more than is necessary. In the position in which the piston is shown the insects are drawn into the nozzle by the suction of the cleaner. At the same time the air coming from the blowing tube escapes through a vent in the piston and a hole in the rear of the cylinder, as indicated by the arrows. As is the case in the other apparatus, a screen prevents the insects from going farther than the glass tube. When it is desired to release the insects the lever is pressed forward. This moves the piston forward until the hole which was previously opposite the sucking connection is now opposite the blowing connection. The air is now flowing out through the nozzle and the insects are forced out with it. At the same time the suction tube to the cleaner is open to the air through the hole in the rear of the cylinder. Different sizes of nozzles are used for different insects as shown in Figure 4. These are easily attached or separated from the rest of the catcher, each one being cemented into a threaded brass nipple.

It was found ~~that~~ ^{that} no matter how strong a draft was used ^{that} some of the larger Hymenoptera could hold on sufficiently to the inside of the tube to prevent their

expulsion. To facilitate their removal, the screen, which is of forty mesh wire, is fastened to a small light metal cylinder. This is fitted into the tube loosely enough to be blown back and forth as the direction of air changes. When in the sucking position the screen is in the position shown in figure 4. When changed to the blowing position, the screen moves forward causing the insects to lose their foothold and be blown from the tube.

A neutral position may be provided in which the piston is between the sucking and blowing positions and there is no movement of air in the tube. ^{catching nozzle.} ~~The insects~~ ^{we have found} ~~may then be examined for the presence of secondaries or~~ ^{this of value when} ~~unwanted species and the contents dealt with accordingly.~~ ^{parasites or other}

We have found this of value when examining for the presence of secondary parasites or other unwanted species

SOME DEVICES FOR HANDLING INSECTS

By George Wishart

Dominion Parasite Laboratory
Belleville, Ontario.

Explanation of Plate

- Figure 1 - Simple suction catching apparatus.
Figure 2 - Catching apparatus with filter for handling Lepidoptera.
Figure 3 - Catching apparatus operated by hand power for handling Lepidoptera.
Figure 4 - Collecting apparatus used in connection with vacuum cleaner.

- C - Cylinder
G T - Glass Tubing
L - Lever
M R - Metal Ring
N - Brass Nipple
P - Piston
P S - Pipe Stem
R T - Rubber Tubing
S - Screen
S F - Silk Filter
S P - Spring
V1 - V2 - Valves.
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