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GENOTYPE

(Presented to you by the Staff of the Genetics Department)

No. 35

1950-51

THIS ISSUE'S STAFF

Faculty Advisor:

Dr. R. A. Brink

Senior Editors:

R. E. Anderson

N. D. Zinder

Junior Editor:

H. E. Kidder

The Genetics Department is extremely fortunate in the high caliber of faculty that it contains. We single out Dr. M. R. Irwin because of the recent national recognition of him and his studies. Congratulations are due him on two accounts, his election as a member of the National Academy of Science and his election as president of the Genetics Society of America.

Dr. Irwin was born in 1897 at Mitchell, S.D. He received his bachelors degree in agriculture from Iowa State College in 1920. In 1928, after spending a few years in the Near East, he obtained his doctorate at Iowa State. The next two years he spent at the Rockefeller Institute for Medical Research. He came to Wisconsin in 1930.

His outstanding studies upon the role of heredity in disease resistance in animals was described as "contributing fundamentally to both immunology and genetics", when in 1938 he was awarded by the National Academy of Science the Daniel Giraud medal in genetics. In April 1950 the National Academy elected him one of their members.

His more recent studies have been on the genic control of the red blood cell antigens in cattle, the chicken, and the pigeon-dove hybrid.

The geneticists of America honored him by electing him their president at the September meeting in 1950.

Closer to home, Dr. Irwin has endeared himself to us by his abilities as a guide and teacher (not to forget his prominent role on prelim committees) and his strength of character as a man.

We take this opportunity to wish him many more years of happy association with the genetics department.

The Golden Jubilee Program of the Genetics Society drew many of the Wisconsin group to Columbus, Ohio, in September. Drs. Lederberg and Irwin were our representatives on the program. Others attending from the department were: Drs. Brink, who presided at the session on "Genetics and the Food Supply", Shackelford, Gilmour, and Esther Lederberg; graduate students Bob Nilan, Bill Stone, Wilmer Miller, Norton Zinder, Walt Plaut, Ron Anderson, Dan Smith, Frank Seto, Kuell Hinson, Herman Gorz, and Phyllis Fried. Also in Columbus for the meetings were Dr. C. L. Huskins and Dr. Gerhardt Sander of the Botany Dept. and Dr. Warren Gabelman of Horticulture.

At the Wednesday morning session Dr. Irwin presented a paper entitled "Genetics and Immunology". Wednesday afternoon Dr. Lederberg spoke on "Genetic Studies in Bacteria".

EVOLUTION

Corn Genetics

Dr. Brink and his students are investigating several aspects of mutation at the complex pericarp (P) locus in corn. Variegated pericarp is being studied most intensively at present. The program is young, but some of the facts already emerging seem to require that this long known mutable gene be viewed in a new light. A considerable volume of work preparatory to the investigation of several other classes of pericarp characters also is in progress. An extensive collection of strains, including several of South and Central American origin, has been assembled and is being screened for new kinds of P genes. Among the undescribed pericarp types which have been recognized thus far, in the material of foreign origin, one or two appear to be of considerable interest. (Incidentally, this kind of corn genetics has its "ups and downs". The ear shoot on one of the South American hybrids pollinated this summer was 12 feet from the ground, which is to say, about six feet above the top of our stepladder. Consideration is being given to the advisability of planting the 1951 crop in post-holes!)

Walter Plaut is checking the effect of added heterochromatin on the expression of variegation.

Douglas Knott is testing for the occurrence of a modifier of VV supposedly linked to the P locus.

Ronald Anderson is studying the heritability of conspicuous self-red mutant stripes on variegated kernels when the stripes are of different widths and at different positions on the kernel.

Robert Milan has obtained evidence suggesting a locus distinct from P, which controls the phenotypic expression of variegated. Certain of the alleles at this "modulator" locus appear to be unstable.

Donald Wood will be studying the distribution of modulator alleles in inbred lines.

Immunogenetics

In the downstairs laboratory, under the guidance of Dr. Irwin, intensive studies in the field of immunogenetics are in progress. The major project of the laboratory is the analysis of cattle blood groups, including the J substance, twins, and new antigenic factors.

William Stone is studying the immunochemical aspects of the red blood cells of cattle.

Wilmer Miller is studying the time of appearance of antigens in pigeons and dove embryos, while Clifford Bryan is doing research on the "hybrid substance" of pigeon-dove crosses.

Sam Scheinberg and Connally Briles (brother of Elwood) are studying the chicken blood groups.

Joy Palm is orienting herself to the problems and procedures in the lab.

The Fly Lab

Prof. Crow, Assistants Morton, Seto, Smith, and Weiner

One of the major projects of the *Drosophila* lab involves a series of studies on the genetic and physiological basis of DDT resistance. Approximately four times as much DDT is required to kill the DDT-resistant flies (obtained by selection continued for about a year) as to kill those of the original strain.

Tests by Richard Weiner with ten insecticides have shown that DDT-resistant flies show varying degrees of resistance to other chlorine-containing compounds, but not to non-chlorinated insecticides. Various aspects of the metabolism of the two strains are being compared using the Warburg apparatus.

Recent work by Dan Smith suggests that the hybrids are nearer the sensitive than the resistant parents in phenotype, indicating that some of the factors for resistance are recessive.

In another *Drosophila* project, flies heterozygous for genes lethal when homozygous were compared in viability with normal flies. Lethals obtained from three sources (x-rayed, spontaneous in laboratory stocks, and wild flies) all appear to cause some decrease in viability, indicating perhaps that these recessive genes have an effect even in heterozygous individuals. Evidence for this is inconclusive, reports Frank Seto.

Newton Morton is starting a project on population size.

Microbial Genetics

A busy place at almost any time is the second floor laboratory. Dr. Lederberg and his students are conducting diverse researches into the control of heredity in bacteria. Dr. Lederberg is continuing his study of persistent heterozygotes of *E. coli*; he is also making an extensive survey of *E. coli* for evidence of a sexual reproductive cycle.

Dr. Esther Lederberg is studying the transmission of lysogenic bacteriophage in the sexual cycle of *E. coli*.

Ethelyn Lively has undertaken research on the cytogenetics of bacteria. A phase microscope and microphotographic equipment have been installed for use in this study.

Norton Zinder is continuing his endeavors in the genetic studies of the pathogenic microorganism *Salmonella typhimurium*.

A new assistant is Phyllis Fried. She has been acting as a general assistant while learning microbial techniques.

Potato Genetics

The Potato Introduction and Preservation Project originally supported by the Experiment Stations of the North Central Region, is now organized on a national basis. The purpose of the project is to establish a center for the preservation and preliminary evaluation of wild and cultivated Solanum species. This reservoir of germ plasm will serve the breeders of the nation in developing improved potato varieties. The project, headed by R. W. Hougas, maintains headquarters in the Genetics Dept. and conducts field operations during the growing season at Sturgeon Bay, Wisconsin.

Gus Stokes is studying white rust resistance, virus resistance, and fertility problems in horseradish.

Sweetclover Breeding

Dr. W. K. Smith reports that considerable headway is being made in the breeding of sweetclovers with low coumarin content.

Kuell Hinson is studying the genetic basis of the barriers between species of sweetclovers.

Corn Breeding

Dr. N. P. Neal is emphasizing cold tolerance and incorporation of stalk rot resistance into early maturing lines in his breeding program. Three new hybrids were released for production in 1950, and two new ones will be released in 1951. Seed stock reserves are being substantially increased, and he contemplates installing cooling equipment for seed storage.

Walton Galinet will continue work begun in Connecticut on corn grass, checking for factors modifying dominance.

Forest Tree Breeding

Robert G. Hitt, instructor in Genetics, who is engaged in forest-tree breeding, sailed January 18 on the Gripsholm from New York for Gothenberg, Sweden. Bob will spend about six months studying the organization of this work and the methods being employed in the Scandinavian countries. Headquarters are being made at the Swedish Institute of Forest-tree Breeding, Ekebo, Kallstorp. The program which Bob is developing here is cooperative with the Wisconsin Department of Conservation. Financial aid for the period of study abroad was furnished by a group of Wisconsin pulp and paper manufacturers.

Fur-Animal Breeding

Dr. Shackelford, until recently a bachelor, forgot to turn in the script prior to his departure February 17th.

Physiology of Reproduction

Wallace Black, Ross Christian, and Lester Ulberg, in cooperation with the Bureau of Dairy Industry, are working on lowered fertility in dairy cattle, and the storage and culturing of bovine ova.

George Robertson is studying the effects of level of food intake, level of protein and pasture vs. dry lot feeding on the reproductive processes of swine.

C. C. O'Mary is studying the possible use of steroid hormones in fattening lambs and controlling the estrual cycle of ewes.

Work is being done by Leigh Woehling on the effects of colchicine on swine and rabbit sperm.

Animal Breeding

Camille Bernard from Prince Edward Island is studying the use and effectiveness of the Index used in Wisconsin Swine Selection Cooperatives.

Jim Craig is working on a study of selection and systems of mating using albino rats as the experimental animals.

Ralph Durham is studying the results of topcrossing inbred boars on sows in Wisconsin farm herds. This is part of the cooperative work with the Regional Swine Breeding Laboratory.

Hassan A. Karam from College of Agriculture, Farouk University, Alexandria, Egypt, is working on the sheep improvement project.

Charles Larson is assisting with certain phases of the dairy cattle breeding project at the Emmons Blaine, Jr. Experimental Farm, Lake Mills, Wis., and with records from the Wisconsin Department of Public Welfare herds.

Milton Madsen is here on sabbatical leave from Utah State Agricultural College, doing graduate work in animal breeding and physiology of reproduction.

Vern Felts is working with the Wisconsin Sheep Improvement Program, contacting the cooperators and getting the records and information needed to index the cooperator's sheep.

HETEROCHROMATIN

The Department of Genetics has sponsored the visits of several noted geneticists during the past year. The general lectures given attracted large audiences from the various biological departments in the University. Participation by the visitors in seminar and discussion groups within the department was also greatly appreciated.

George Beadle of Cal Tech reviewed the wide scope of genetical research in progress at the Kerckhoff Laboratories.

L. J. Stadler of the University of Missouri discussed the current status of his work on the R locus in corn.

D. F. Jones of the Connecticut Agr. Exp. Sta. spoke on cytoplasmic male sterility in corn.

John Gowen of Iowa State College reviewed unpublished work on heterosis in *Drosophila*, involving characters such as egg-laying capacity and time of maturation.

Jay Lush of Iowa State College surveyed present developments in livestock breeding.

Arne Muntzing of the Institute of Genetics, Lund, Sweden, lectured on "Accessory Chromosomes in Plants" and "Induced Polyploidy in Crop Plants".

Boris Ephrussi of the University of Paris presented two lectures on the genetics of yeasts, emphasizing cytoplasmic inheritance.

Dr. Douglas Gilmour of Cambridge University, England, spent six months here as a post-doctoral fellow working on chicken blood groups.

Art Fleming, former Genetics field foreman, is now successfully combining Wisconsin milk production knowledge and dairy stock with southern Alabama pastures. He has brought back some fine pecans from his grove on trips to Madison. The Flemings are living near Fairhope, Alabama, just a few miles south of U.S. Highway #90.

Charles Lerson and Hassan Karam attended the conference on Heterosis and the Statistical workshop at Ames this past summer.

In August Dr. Chapman attended the Regional Swine Breeding Conference of Collaborators, Lincoln, Nebraska.

John McFarlane (Ph.D. '42) and his wife were Madison visitors in October. John is a geneticist with the USDA at Salinas, California, working on sugar beet breeding.

C. O. Erlanson, Chief of the Division of Plant Exploration and Introduction, was a recent visitor to the campus. He spoke on the history and the current work of the Division.

Dr. Rieman was elected vice-president of the Potato Association of America at their annual meetings at Memphis, Tennessee, in December, 1950.

Walter Plant attended the 7th International Cell Biology Congress at Yale on September 4-8, 1950.

Clyde Stormont (Ph.D. '47) worked on blood groups at the Wallaceville Animal Research Station, New Zealand, from October 1949 to May 1950, on a Fulbright appointment. He has since taken a position as Assistant Professor of Veterinary Medicine and Assistant Serologist in the Experiment Station, University of California at Davis.

Dr. Neal lectured on breeding for cold resistance in corn at the Cornell Seed Producers School held at Ithaca, New York, in November, 1950.

Three agronomists from the Netherlands spent a week during the summer and another during the fall at Madison and the Spooner branch station studying breeding and production problems in corn. The Netherlands expect an 8 to 10-fold increase in corn acreage in 1951.

The film "Wisconsin Corn Hybrids", produced under the direction of Dr. Neal, is now being shown in France under the auspices of FAO. It is also booked for a month in Sweden.

Four Genetics Department staff members took part in a Heterosis Conference held at Iowa State College last summer. Those presenting papers were Drs. Brink (Developmental Effects and Heterosis), Irwin (Specificity of Gene Effects), and Crow (Dominance and Overdominance in Heterosis), while Dr. Chapman presented some of his work at the statistical workshop held in conjunction with the conference. The entire setup was unusual in that only one or two papers were given each morning and were discussed extensively that afternoon. This leisurely pace allowed for much more interchange of ideas than is usually possible. Nevertheless, the principal problems of heterosis remain unsolved.

Royce Bringhurst (Ph.D. '50) writes that February finds him busily pollinating avocados. Southern California weather must be enjoyably different from that of Wisconsin.

Herman Gorz (Ph.D. '51) is teaching genetics and doing forage crop breeding work at North Dakota State College.

Harold Hackerott, agronomist at the Texas Research Foundation, Renner, Texas, was in residence here the first semester and will be back later this spring to do further work in alfalfa breeding.

Margaret Hayes Smith, former departmental secretary, was a visitor in the fall of 1949. Her home is in Terre Haute, Indiana.

Alumni visiting during the past year have been:

Jack Adams of the Associated Seed Growers, New Haven, Connecticut.

Jos. Jackobs, Agronomist at Washington State College.

Herb Albrecht, Chairman of the Agronomy Department at Penn State.

L. D. Hershberger of the public school system in Oshkosh, Wisconsin.

W. W. Yapp, Professor of Dairy Husbandry at the University of Illinois.

Lionel Dessureaux, Agr. Research Officer at Ste. Anne de la Pocatiere, Quebec.

S. S. Munro, Geneticist for the Wash. Coop. Chick Association, Bellingham, Washington.

Andy Malbandov, Animal Physiologist at the University of Illinois.

C. E. Holmes of the Poultry Department at V.P.I.

Lewis W. Taylor, Poultry Division, University of California at Berkeley.

C. R. Burnham, Plant Geneticist at the University of Minnesota.

J. S. McFarlane, Geneticist with the U.S.D.A. at Salinas, California.

Among foreign visitors to the department during the past year were Dr. P. C. Joshi, East Punjab University, East Punjab, India; J. R. S. Frisham, Botany School, Cambridge, England; N. Puri, Professor of Botany at Meerut College, Meerut, India; William Davies of Stratford-on-Avon, England; Rupert Best, Senior Agricultural Chemist at the University of Adelaide, Adelaide, So. Australia; Richard Kuhn of the Max Planck Institute, Heidelberg, Germany.

Visitors from Sweden were S. Pettersson of Ostansjo; Erik Akerberg of the Royal Agricultural College at Upsala; Erik Bjorkman of the Royal School of Forestry at Stockholm.

Dr. L. E. Casida and Mrs. Casida flew to Europe this summer where Dr. Casida had been invited to present a paper on "Functional Sterility" at an International Study Day held at the University of Ghent, Belgium. The Casidas also visited France, Switzerland, England and Scotland.

L. C. Ulberg, C. C. O'Mary and C. Bernard presented papers at the annual meeting of the American Society of Animal Production in Chicago.

E. L. Lasley was called back into the navy, and is now in Sicily.

Dr. Casida gave an invitational paper on Animal Fertility at a meeting sponsored by the Committee on Human Reproduction of the National Research Council, in New York on January 19, 1951.

Claire Busk Bailey is attending a laboratory technicians course in Racine, Wisconsin. Her husband is teaching at the University Extension Center located there.

Jean Cross Van Den Berghé is a happy housewife here in Madison. The editors hear that a fragmentation is expected soon.

Dr. F. H. Horowitz of Cal Tech visited the campus in July, 1950, to give one of a series of lectures sponsored by the Enzyme Institute. He also reviewed his work at an informal seminar here in the department.

Dr. E. B. Babcock of the University of California stopped in Madison on his return trip from the National Academy of Science meetings last spring. He gave two talks while here.

Dr. H. H. Smith of Cornell University visited us briefly in August.

Drs. C. R. Burnham of the University of Minnesota and D. W. Robertson of Colorado A. and M. were among those attending the Barley Conference in Madison in January, 1951.

Miss Ethelyn Lively spent the summer at Hopkins Marine Station, Pacific Grove, California, taking a course in microbiology from Dr. C. B. Van Niel.

Dr. Joshua Lederberg was guest lecturer this summer for the Bacteriology Dept. of the University of California at Berkeley. He taught and conducted seminars in Bacterial Genetics. He and Esther stopped at several research centers on their trip through the western U.S. These stops included the Mayo Clinic at Rochester, Minn., the University of Colorado and the Colorado Medical School, Cal Tech, and the University of Missouri. They visited Dr. Dobzhansky at his summer station near Yosemite and the Stormonts at Davis, Calif.

It is hoped that with completion of Babcock Hall, a series of departmental moving reactions will set in. The net result to us will be use of the entire Genetics Building. A tentative plan for allocation of space has been worked out.

SOCIAL EVENTS

The Linkage Group enjoyed a successful season in 1949-50 under the vigilant eye of Doug Knott. The Christmas dinner held at the Union uncovered hidden talent amongst the group. A lustily-voiced ditty which introduced the faculty and a skit parodying a prelim examination were followed by group-participation games. A crossword puzzle featuring genetic and Yuletide terms served to sharpen appetites before the meal.

The annual picnic at the end of the spring semester was held at Burrows Park. Softball, volleyball, and eating were the major attractions. A notable feature was the large number of children in the group. The negative correlation between education and family size definitely does not hold for the Linkage Group.

This year the Linkage Group flourishes under the guidance of Walt Plaut. The Xmas dinner, with the site changed to the Congregational Church, was a huge success. There were more funny songs, and a skit wherein each member of the faculty, after being suitably sworn in, presented his case in the "Race for Space". Final allocation was, of course, decided by a committee of grad students. Bill Stone, an untiring comic, then M.C.'ed a few group games. Volume I of the Phenotype, a sub-standard version of the Genotype, was distributed. Volume II will never appear, by popular demand.

The question brought before you on page 8 of the last Genotype can now be answered. We quote, "When will the last of the holdouts, that noted fur-animal geneticist, be taken by surprise, and find himself bound for life?" The answer-- February 17, 1951. On that date Ruth F. Rayner and Professor Richard M. Shackelford were married in Bethel Lutheran church in Madison. The staff attended en masse, and reports that Max was a most distinguished and happy bridegroom.

Coffee hour before seminars is an enjoyable custom revived this year. Coffee and doughnuts are served each week. A slight fee payable to Custodian of the Treasury Nilan is the only unpleasant feature. Credit for the fine coffee goes to Bette Schotten.

With added manpower furnished by Agronomy and Plant Pathology, the Genetics Department fielded a softball team in the Ag. Grad League. The Pathgenagrone (patent applied for) finished with a creditable record. Lefty Nilan and Hurler "No Smoke" Stone were among our many stars. Norton Zinder was the classiest fielding third baseman in the league. The Knott-Anderson battery can currently be found playing basketball in the Grad league.

CROSSOVERS AND TRANSLOCATIONS

	<u>Title</u>	<u>Address</u>
Nancy Kent Ziebur	Res. Asst. in Bacteriology	27A College Cts. Stillwater, Oklahoma
Mohamed A. K. Ali		College of Agriculture Fouad 1st University Giza, Cairo, Egypt
Robert I. Brawn	Asst. Professor	Department of Agronomy Macdonald College P. of Quebec, Canada
Robert K. Oldemeyer	Plant Breeder	The Great Western Sugar Company Longmont, Colorado
Pryce B. Gibson	Assoc. Plant Breeder	Dept. of Agronomy & Soils Alabama Polytechnic Inst. Auburn, Alabama
R. S. Bringhurst		Div. of Subtropical Hort. University of California Los Angeles 24, California

	<u>Title</u>	<u>Address</u>
Alvin C. Wernick	Assistant Professor	Dept. Animal Husbandry Oregon State College Corvallis, Oregon
Earl Wiggins	Animal Geneticist	U.S. Sheep Exper. Station Dubois, Idaho
Syed M. Jafar		Office Training Inst. Shahrahe-Osmani Hyderabad, India
Mohammed Jafar		No address
Herman Gorz	Assistant Professor	Dept. of Agronomy North Dakota State College Fargo, North Dakota
Stanley Peloquin	Res. Associate	Dept. of Botany Marquette University Milwaukee, Wisconsin

ACQUIRED CHARACTERS

	<u>Major Professor</u>
Camille Bernard (B.S., Laval)	Chapman
Connally Briles (M.S., Texas A.&M.)	Irwin
Clifford Bryan (B.S., Howard)	Irwin
James Craig (M.S. University of Illinois)	Chapman
Leo Dionne (B.S., University of New Brunswick)	Brink
Phyllis Fried (B.A., Brooklyn College)	Lederberg
Walton Galinat (B.S., University of Connecticut)	Neal and Cooper
Kuell Hinson (B.S., Tennessee Polytech)	Smith
Branch Howe (M.S., Emory)	Crow
Yung-Ling Hung (B.S., National Northwestern College of Agric.-- China)	Rieman
Bill Kidder (B.S., Colorado A. and M.)	Casida
Earl Lasley (M.S., North Dakota)	Casida
Charles Larson (B.S., University of Connecticut)	Chapman
Ethelyn Lively (B.S., University of Georgia)	Lederberg

Milton Madsen (M.S., Utah State)	Major Professor Chapman
Newton Morton (B.S., University of Hawaii)	Crow
C. C. O'Mary (M.S., Auburn)	Casida
Joy Palm (B.S., Rhode Island State)	Irwin
George Robertson (M.S., Texas A. and M.)	Casida
Sam Scheinberg (M.S., Iowa State)	Irwin
Frank Seto (B.S., Berea)	Crow
Dan Smith (B.S., Johns Hopkins)	Crow
Granville Stokes (B.S., Purdue)	Rieman
Richard Weiner (B.S., Wisconsin)	Crow
Leigh Woehling (M.S., Penn State)	Casida
Donald Wood (M.S., Colorado A. and M.)	Brink

EXPERIMENTS IN DOMINANCE

Marilyn Estreicher and Norton Zinder-----December 24, 1949.
Jean Cross and John VanDen Berghe-----June , 1950.
Claire Busk and George Bailey-----August 5, 1950.
Joan Hollinshead and Douglas Knott-----September 2, 1950.
Carolyn Plowman and Camille Bernard-----January 25, 1951.
Ruth Rayner and Richard M. Shackelford-----February 17, 1951.

FRAGMENTATIONS

<u>Sara Pauline Bermen</u>	Daughter of Dave and Rhoda, born April 12, 1950.
<u>Bruce William Black</u>	Son of Wally and Betty, born September 4, 1950.
<u>Lawrence Edward Christian</u>	Son of Ross and Moody, born October 23, 1950.
<u>Wendy Leigh Dionne</u>	Daughter of Leo and Peg, born November 4, 1949.
<u>John Wallace Durham</u>	Son of Ralph and Jane, born July 7, 1950.
<u>Kathleen Louise Dutt</u>	Daughter of Ray and Louise, born November 11, 1950
<u>Stephanie Charlotte Kunz</u>	Daughter of Georges and Cora, born October 30, 1950.
<u>Samuel Leon Moore</u>	Son of the Leon Moores, born August 2, 1950.
<u>Malcolm E. Robertson</u>	Son of George and Florence, born July 21, 1950.
<u>Jerry Mordechi Scheinberg</u>	Son of Sam and Helen, born November 4, 1950.
<u>Charles Stormont</u>	Son of Clyde and Marguerite, born August , 1950.
<u>Elizabeth Ann Weber</u>	Daughter of Al and Eleanor, born May 14, 1950.
<u>Elizabeth Ann Wiggins</u>	Daughter of Earl and Kay, born July 4, 1950.
<u>Stephen Henry Zinder</u>	Son of Norton and Marilyn, born October 22, 1950.

SURVIVAL OF THE FITTEST

Doctors - - Dave Berman, Royce Bringham, Pryce Gibson, Herman Gorz, Syed Jafar, Lois Jones, Esther Lederberg, Bob Oldemeyer, George Rush, Al Warnick, and Earl Wiggins.

Prelims - - Ron Anderson, Ross Christian, Ralph Durham, Doug Knott, Bob Nilan, Stan Peloquin, Walt Pleut, and George Robertson.

Masters - - Jean Cross, Kuell Hinson, Bob Hitt, Frank Seto, and Dick Weiner.