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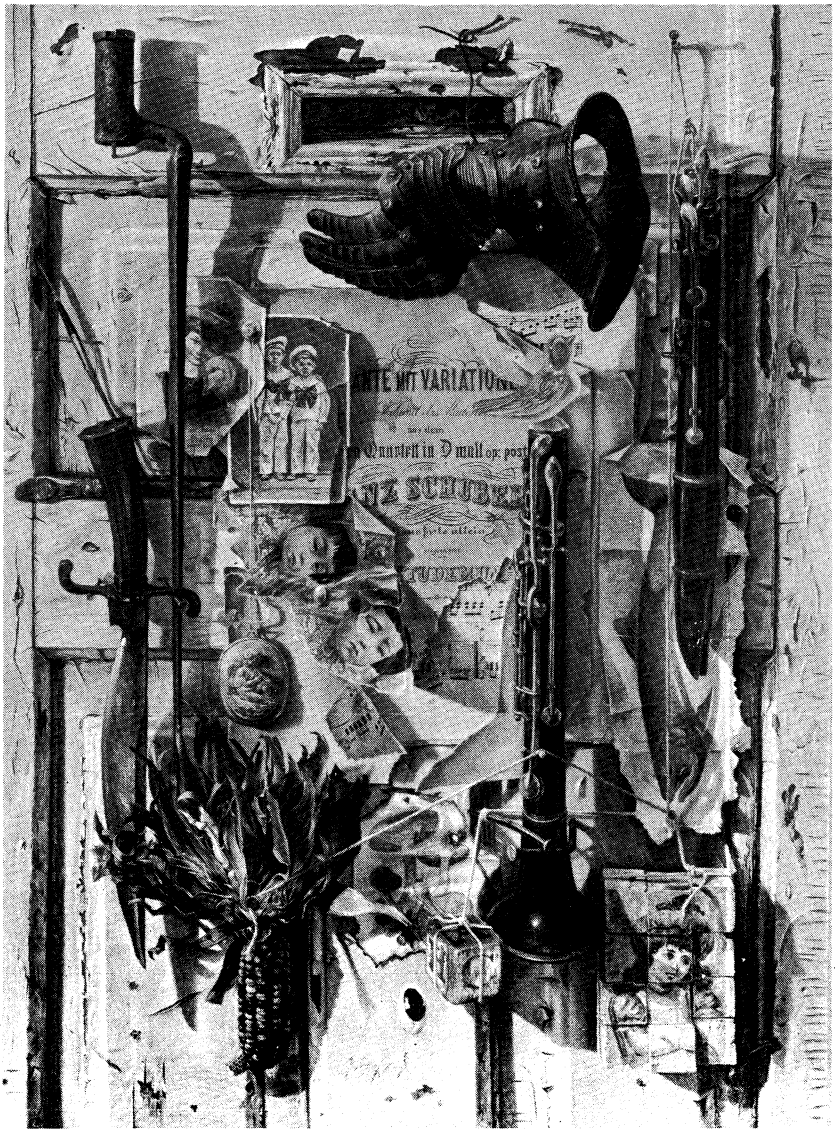
WISCONSIN ACADEMY REVIEW

SUMMER, 1956



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WISCONSIN ACADEMY REVIEW

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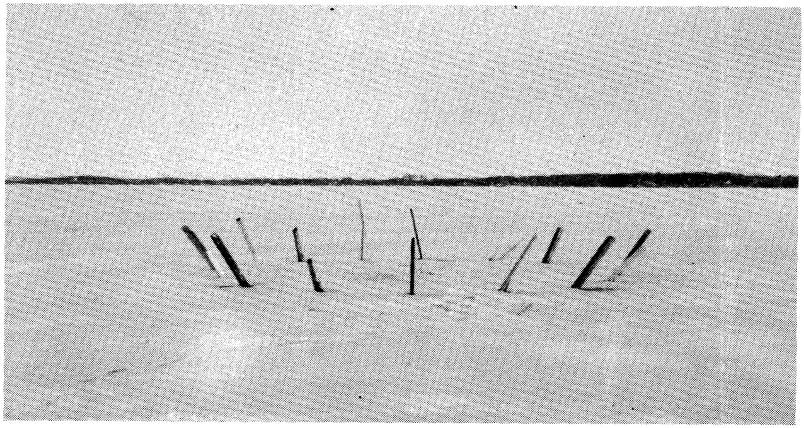
CIRCULAR TAKE OFF AND LANDING OF AIRPLANES

By J. G. Winans
Department of Physics, UW

To demonstrate that airplanes can operate safely from small fields, an Ercoupe airplane was taken off and landed by means of a rope which fastened the plane to an anchor on the ground. Experiments were conducted on the ice of Lake Kegonsa near Stoughton, Wisconsin during the winter of 1954-55 and 1955-56. In the final arrangement a nest of 16 posts frozen in the ice around the rim of a 22 ft. diameter circle served as the ground anchor.

For take off one end of a 500 ft. rope was wound about twice around the nest of posts and tied to one of the posts. The other end was attached to the outer part of the left wing of the plane by means of a special release mechanism. This enabled the pilot to cut loose from the cable at will by pulling on a cable in the plane. The plane takes off while held in a circle either winding up or unwinding the rope. After one quarter turn the plane is airborn and after another half turn the plane is 200 ft. up. The plane is then cut loose and continues along the tangent to the circle with no inward or outward jerk. The speed and elevation at release provide a gain of about 300 ft. elevation over that for a straight take off. In landing a 1500 ft. rope with a weight of about

Summary of paper presented at 86th Annual Meeting of the Academy on May 4, 1956, Marquette University, Milwaukee.



20 lbs. on the lower end is let out from the plane. The plane is then flown in a circle thereby causing the weight to hang with little motion near the center of the circle. The plane descends until the weight touches the ground and then flies in a path to drag the weight into the nests of posts. The weight then wraps itself around one of the posts. The slack in the rope prevents any jerk on the plane. The plane is then flown at about 100 ft. elevation in a circle of about 500 ft. radius until all but about 400 ft. of rope has been wound up around the nest of posts. After this the plane is landed while being held in the circle by the rope. About one half turn is needed for landing.

Circular take off offers a good procedure for launching the earth satellite. A two stage rocket carrying the satellite could be given a speed of about 2000 miles per hour by being whirled at the end of a rope from the top of a mountain and cut loose while travelling east. A speed of about 1000 mph. with respect to the earth would combine with the 1000 mph. speed of the earth's rotation to give about 2000 mph. for the satellite rocket before the use of any of the rocket's own fuel. The rocket would be directed upward by small wings and by the curvature of the earth down under it. When the top of the atmosphere is reached, the part of the rocket containing the wings would be shot toward the rear and the second stage rocket containing the satellite would continue to the required 18,000 mph. speed. With circular launching, much of the energy needed for the satellite can be supplied by electricity and the launching procedure simplified over that for a three stage rocket starting from rest.

# # #

SOME PROBLEMS OF THE NORTHEASTERN WISCONSIN FOREST BED

By F. T. Thwaites*
Madison

Forest Bed is the name given to a deposit of trees, stumps, roots, branches, peat, and mollusks which was discovered by J. W. Goldthwait about 1905. It is exposed in the bank of Lake Michigan near the line between Kewaunee and Manitowoc counties. The organic remains are covered by glacial till. Their presence raises important problems.

Deposits. In the area we find descending:

Beach gravel and some clay of Glacial Lake Algonquin - 1 to 5 feet

Red glacial till, some logs of wood - average about 10 ft.

Sand, gravel, and clay mainly highly folded by motion of the ice which deposited the layer above, contains driftwood - maximum 30 feet

Logs, peat, etc. with some stumps in place - less than 1 ft.

Red clay, locally a little sand, layers show deposition mainly in a glacial Lake much distorted by pressure of overriding ice - about 10 feet

Gray till, much clay - unknown

Organic remains. The trees in the Forest Bed are, so far as known, all spruce. In the peat at least 7 species of mosses have been identified. Mollusks of several species have been discovered. Evidently the soil where the trees grew was moist but not covered by water. An interesting feature is that the growth rings of many of the trees are much narrower near the outside than inside and thus suggest a cooling climate.

History. Drawing our conclusions from the data above, we infer:

(a) glaciation by ice which moved south in the basin of Lake Michigan and which brought the gray till,

(b) recession of this ice leaving a glacial lake enclosed at the north in which the lower red clays were laid down,

(c) retreat of the ice margin to free both the Straits of Mackinac and the St. Lawrence Valley with consequent warming of the climate, and low water level,

(d) growth of the Forest Bed, the seeds of which were brought in by wind,

(e) readvance of the ice overriding older clays; sand and clay were deposited on top of the Forest Bed in a

* - Emeritus Prof. of Geology and Assistant to State Geologist. Subject of talk presented at the April 10, 1956 meeting of Madison Geological Society, Madison, Wis.

second glacial lake; the trees were killed by submergence, but were kept damp in water,

(f) advance of the ice which disturbed the older deposits, cooled the climate and left the red till,

(g) melting away of this ice leaving another (third) glacial lake enclosed at the north and called Lake Algonquin,

(h) opening of a very low outlet to the northeast which caused the water level to fall about 350 feet lower than the modern Lake, (not proved at this point but concluded from other places),

(i) uplift of land in Canada which caused water to rise to level of Lake Nipissing about 25 feet above the modern Lake,

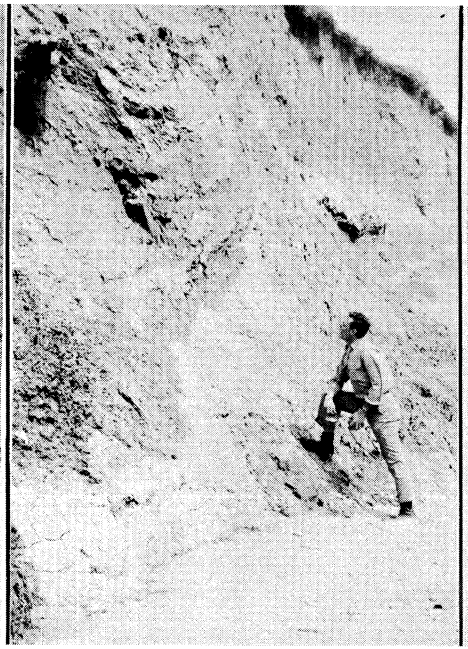
(j) erosion of the outlet at Port Huron, Michigan, which lowered the water level to the present and cut back the shore to lay bare the Forest Bed.

Age of the Forest Bed. The Forest Bed proves an important oscillation in the history of melting of the last ice invasion but the age of this event in years was only guessed at until recently. Now the discovery by Prof. Libby of the Institute of Nuclear Studies of Carbon 14 has opened a possible means of supplying this information. Prof. Libby concludes that Carbon 14, also called radiocarbon, is made by the action of cosmic rays on the nitrogen of the atmosphere. He thinks that it was incorporated into all living organisms in substantially the same amount as today. After the death of the organisms all chemical change ceased and the radioactivity of the Carbon 14 gives us a measure of the time since the death of the organisms. This method was applied to the trees and peat of the Forest Bed and the average result was about 11,400 years before the present. The total difference in results for the first 5 specimens was 1,291 years.

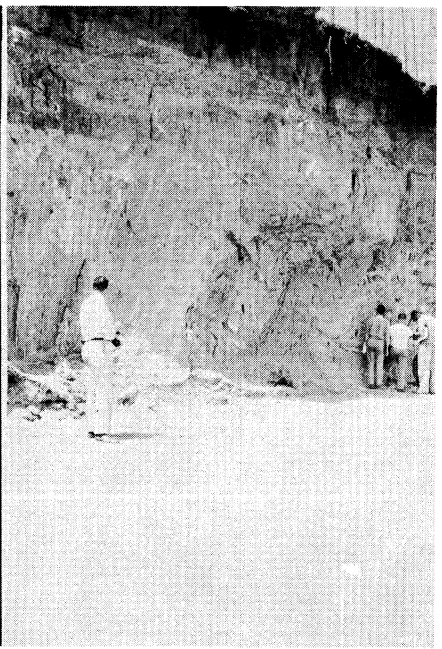
In attempting to obtain a check, a specimen of wood from Appleton was run with the surprising average of two determinations of only 6,400 years. Subsequently several other specimens from different places in the Fox River Valley, as well as the original locality, gave results which vary from 9,330 to 10,856 years. It is fair to say that although the trees might not be all of exactly the same age, the Forest Bed appears to have lived about 10,550 years ago. After the ice buried the trees it continued to advance its margin south to Milwaukee.

Criticism of age determinations. Is the age determined by radiocarbon reliable? The variation of results suggests that the method is not very accurate. It rests also on some assumptions. Was the content of radiocarbon the same in the atmosphere as it now is? Is the idea true that no chemical change has occurred since burial?

Remnant of upper sand with holes which contained logs before the students got there. Dark band below is real Forest Bed.



Place where lower clay has been intruded through all deposits up to red till on top.



Same area as No. 1 shown at right with strata of gravel disturbed by ice shove at left and cut off level above by red till--graphic proof that red till is an ice deposit, not a lake clay as held by T.C. Chamberlin long ago.

There is no direct way of answering the first question. So far as the second is concerned the wood has decayed considerably although it is still firm enough to cut with a saw. In this decay it has given off carbon dioxide which has bleached the adjacent heavy red clay and till to a greenish-gray color. Ground water is circulating through the Forest Bed and this water contains carbon dioxide derived from the decay of modern vegetation. This water must contain some radiocarbon which at no time makes up more than about 1 part in a trillion of ordinary carbon. Can some atoms of the ordinary carbon in the wood have been replaced by atoms of new radiocarbon? Some say this is impossible but offer no proof. Or can some undecomposed modern organic matter have been deposited in the old wood? Both processes are proved in minerals, so why are they impossible with wood? That one specimen which was so radically different from all others leaves us in grave doubt. Perhaps the future may yet demonstrate that radiocarbon dating of specimens which have been exposed to ground water is unreliable.

Antevs, who has tried dating by the annual layers in the clays of glacial lakes, concludes that the Forest Bed is 19,000 years old. Is he right or wrong? If the radiocarbon is right, then early man was living in the southwest at the time the glacier front was at Milwaukee, which many think is not reasonable.

# # #

KILMER AND CAMPION

This last formal portrait of Joyce Kilmer (by Underwood and Underwood), celebrated World War I soldier-poet, was published by the Campion High School magazine in 1919 and was republished on the cover of their May 1956 Campionette. Because of Kilmer's associations with Campion at Prairie du Chien, the school's president published a book, "Kilmer and Campion" and the school's library was named after him. Father JOHN M. SCOTT, S.J., in a recent article, "Joyce Kilmer Slept Here," quotes the inscription on the dedicatory plaque as follows:

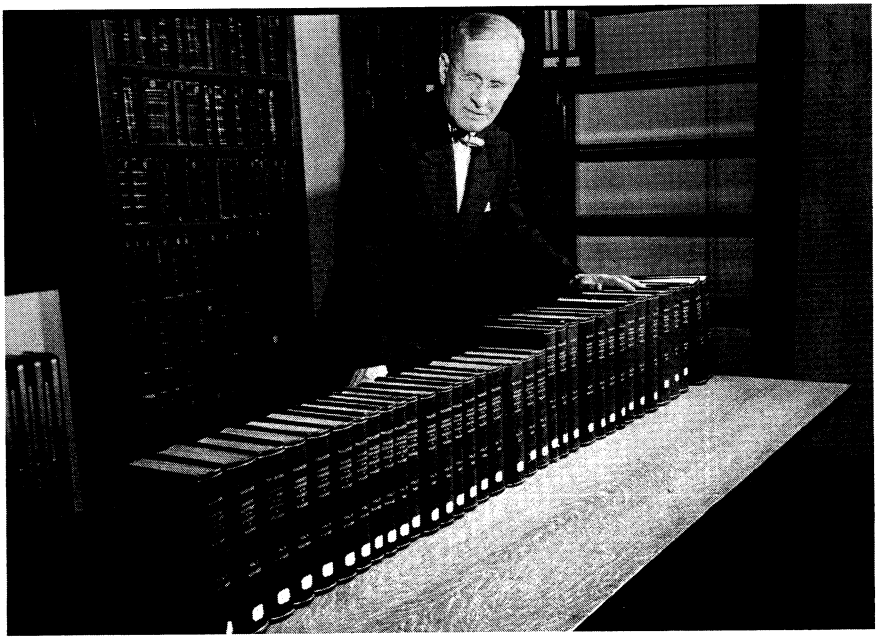
"To the memory of Joyce Kilmer, poet and patriot, Sergeant of the 165th Infantry A.E.F., the "Fighting Sixty-Ninth" of New York. Born December 6, 1886, Killed in action July 30, 1918. This library has been erected through the devotion of his friend, Claude Pernin, S.J." Copies of a reprint from the May 1956 Campionette containing Kilmer's June 15, 1917 address to the graduating class and historical summary are available for 25¢. # #

AN ADVENTURE IN BIBLIOGRAPHY

By Henry A. Schuette
Department of Chemistry, UW

It was only a short note that sent us off on this adventure, but the project into which it grew proved to be a long one. In a sense it provided the point of departure for the account which follows.

During the midwinter of 1931 the editor of Dictionary of American Biography wrote to inquire if someone in the Department of Chemistry might be found who would have the time and inclination to contribute an article on English chemist David Boswell Reid who, some 72 years before, had held a professorship at the University of Wisconsin. The letter was referred to us for attention. Neither the standard honorarium for such a contribution, nor its word-limit offered little, if any, attraction for complying with the request. But the opportunity of learning something about him, his activities, and his contributions to science; that put the request in another light. Here lay a real challenge, particularly so when a cursory search of the available material on Dr. Reid revealed that he was, indeed, almost a forgotten man in the historical records of the University of Wisconsin.



This observation suggested studies on other facets of the Department's past as, for example, who comprised the staff, what manner of men were they, what contributions to knowledge did they leave behind as printed memorials of their times and the state of chemistry when they were active. Would not a reprint bibliography of their publications provide source material readily available and in compact form for a chapter or two on the history of the Chemistry Department? Exactly 35 bound volumes of reprints now shelved in the stacks of the Chemistry Library--in only a few instances was photostatting necessary--contain the answers to this question.

Fortunately--perhaps only so, however, for the bibliographer--was the fact that the early professors were general teachers and not specialists and that research with its resulting publications was to come later with the growth of the University. They were not in the picture until 1870, and even so, it was not until the end of the century that enough papers had been published to make a volume of respectable size possible.

Space does not permit comment or appraisal of the contents of that first volume but we cannot close this account of our adventure without making reference to Prof. Ezra Slocum Carr (1856-1868). His inaugural address, the Claims of the Natural Sciences to Enlarged Consideration in our Systems of Education, -- yes, they did it in those days--before the Board of Regents in the Senate Chamber of the Capitol, January 16, 1856, is number one in the reprint collection. By modern standards it is platitudinous, yet for all that he made an eloquent appeal for the cause. That Prof. Carr had a very practical eye will be noted in the following quotation, "The University belongs to the state, make it what it should be, and an influence will go down from it through the colleges, the academies and schools and abroad through the whole community which will prove its value, and endear it to the heart of every citizen." His address closed on a note of flattering prophecy: "Looking into this great west with an eastern eye, I have long thought it the destiny of Wisconsin to become the educator in the galaxy of states."

We introduced a statistic into this report in a preceding paragraph; and by the same token we close on one. The 35 volumes contain 1856 reprints, the titles of 43 books, and references to 136 book reviews. The latter figure is probably an understatement. The sum total of the hours spent in browsing through the tables of contents of domestic and foreign scientific journals of an earlier day, the pounds of books lifted from the shelves, and the lines of print perused and copied, were not made a part of the record of this bibliographic adventure. The job

done, it was turned over to the care of the departmental librarian; and it is rolling along on its own momentum with the cooperation of the staff members whose annual productivity is currently of the order of magnitude of about 90 papers.

# # #

OFFICIALS OF UW-MILWAUKEE APPOINTED BY REGENTS

Left to right, seated: JOSEPH G. BAIER, Jr., dean of Letters and Science; J. MARTIN KLOTSCHE, provost and GEORGE A. PARKINSON, vice-provost and director of business affairs. Standing: GLEN G. EYE, acting dean of education and ROBERT E. NORRIS, dean of student affairs.

The University of Wisconsin-Milwaukee will open as a single institution with two campuses in Milwaukee in September. According to the statement of principles and policies adopted by the regents, present plans call for four-year courses in liberal arts, education and commerce. In a recent speech, Parkinson predicted there will be 10,500 students attending UW-M within 10 years and 15,000 enrolled within 25 years. (The fall 1955 enrollment of the UW Madison campus was slightly over 15,000.) # # #

THE PLEASURES OF SCIENCE AND THE PLEASURES OF POETRY

By Frederick I. Tietze
Dept. of English, UW Extension, Racine

In 1800 the Poet Wordsworth made the bold assertion that it is "the grand elementary principle of pleasure, by which [man] knows, and feels, and lives, and moves." Regarding the way in which poetry both cultivates and satisfies this principle of pleasure, there is no essential denial, though there is endless discussion. But to link pleasure and science, to suggest that scientific pursuits are conducted in an atmosphere of pleasure or with some pleasurable gratification as the goal is to fly in the face of almost the whole scientific canon: science aims at objectivity, but pleasure is subjective; science exalts man's rationality, but pleasure is by definition a felt experience; science seeks universal truths, but pleasure and poetry are individual experiences.

No, one would say at first thought, scientific pursuits are conducted in an atmosphere of reason; emotions, pleasurable or otherwise, are not a legitimate part of that atmosphere. Moreover, science aims ultimately at very practical goals; the laboratory scientist and the engineer together are in search of "better things for better living," or, as an earlier publicist, Francis Bacon, phrased it, they seek "the relief of man's estate." It is hardly necessary to point out here how successful that search has been. Indeed, Warren Weaver has judged the achievements made through the physical sciences as "probably the most conspicuous, the most universally recognized, and the most widely applied...the most tangible and obvious" of all the achievements of mankind since the dawn of history.

The utility of these achievements, percolating down to the veriest layman as he reads his newspaper, ultimately touching his life somehow by way of his health, his diet, his comfort--this utility has for the layman a corollary in the psychological realm. He may or may not comprehend the rationale which led to some new discovery in medicine or in plant breeding, or the industrial processes whereby the discovery is made to affect his life, but he does sense, even if mutely and vicariously, that pride of achievement which attends man's more complete control over his physical environment. The powers of man, generically speaking, having been enlarged through his own efforts

Summary of talk presented at 86th Annual Meeting of the Academy on May 5, 1956, Marquette University, Milwaukee.

by means of science and technology, he brings nature into fuller subjection and becomes more completely a free agent, no longer the plaything of Fortune. This conviction is unquestionably widespread and unquestionably pleasurable.

But there have been voices raised against the totally utilitarian regard for science. J. F. W. Herschel, the astronomer son of an astronomer father, wrote in 1830 that "utility is a pleasant companion, but truth is a beloved friend." The question "cui bono?" when applied to knowledge was, he felt, "humiliating." William Whewell, the mineralogist and historian of science at Cambridge, warmly affirmed his friend Herschel's stand. And Newman, far though he is from the scientists, in 1852 asserted that "knowledge is capable of being its own end. Such is the constitution of the human mind that any kind of knowledge, if it be really such, is its own reward." References to this reward are no longer made defensively. In every discipline, the phrases "contribution to knowledge," "extending the frontiers of knowledge," have become commonplace. Among scientists and among educated laymen there is no dispute over the view that knowledge can be an end in itself, and thus a pleasure in its own right.

Among the naturalists and nature writers there is candid recognition of the pleasure that comes with knowledge. These writers, though they vary greatly in their claims to recognition as scientists, nevertheless all share the scientist's respect for exact observation. They start from that. But it is seldom long before their own pleasure unashamedly intrudes itself into their notes; they personalize their observations. Thus we have the testimony of John Burroughs:

> All that science has to tell me is welcome, is, indeed, eagerly sought for. I must know as well as feel. I am not merely contented, like Wordsworth's poet, to enjoy what others understand. I must understand also; but above all things I must enjoy. How much of my enjoyment springs from my knowledge I do not know. ...To enjoy understandingly, that, I fancy, is the great thing to be desired.

If it be objected that the naturalists present a very special case, there is counter testimony from the very citadels of laboratory science, reported by the physicist Sir Edward Appleton in The Bulletin of the Atomic Scientists:

> Perhaps the most striking fact about modern science in its explorations ranging from the heart of the atom to the frontiers of the

> universe is that, like poetry, like philosophy, it reveals depths and mysteries beyond, and, this is important, quite different from the ordinary matter-of-fact world we are used to. Science has given back to the universe, one might say, that quality of inexhaustible richness and unexpectedness and wonder which at one time it seemed to have taken away from it.

Finally, while it might be hazardous to speak of a "pleasure motive," nevertheless a pleasure effect attends the work of the scientists. At its highest reaches, the pleasure afforded by science is different neither in kind nor in degree from the pleasure afforded by poetry: the sense of infinite possibility, which challenges the imagination of man and chastens that pride of accomplishment he so easily feels as he views science in its purely useful aspects. Joseph Wood Krutch has justly observed that "all men live more intimately and significantly in the world as they feel it than in the world of what common-sense materialists call realities." Feeling is communicable, and science can make men feel their world as well as "know" it.

# # #

SEEK THE TRUTH.

"The search for truth is difficult enough in the natural sciences, but in the vast fields of the social sciences and the humanities, truth becomes even more elusive, and it is tempting to yield to scepticism or sheer relativism. . . .

"Eighteen hundred and ninety-four was a time of bitter social turmoil and fear in this state when the freedom of the University was under attack as perhaps never before or since. One of the University's greatest economists, Richard T. Ely, had, in effect, been put on trial. On September 18, 1894, the Board of Regents approved unanimously the trial committee's final report...which for all time set forth the basic principles of operation of a great State University. The report said in part:

"'As Regents of a University with over a hundred instructors supported by nearly two millions of people who hold a vast diversity of views regarding the great questions which at present agitate the human mind, we could not for a moment think of recommending the dismissal or even the criticism of a teacher even if some of his opinions should, in some quarters, be regarded as visionary. . . . We cannot for a moment believe that knowledge has reached its final goal or that the present condition of society is perfect. ...We feel that we would be unworthy of the position we hold if we did not believe in progress in all departments of knowledge.'" -- Excerpts from the Charge to the Graduates by President E. B. Fred, UW Commencement, June 15, 1956. # # #

EIGHTH ANNUAL WISCONSIN SCIENCE TALENT SEARCH

By Roy J. Christoph, Carroll College
Chairman, Wisconsin Science Talent Search

Eighteen seniors from the 1956 graduating classes of Wisconsin high schools were named winners in the Eighth Annual Wisconsin Science Talent Search sponsored by the Academy in cooperation with the Junior Academy and Science Clubs of America. Announcement of the results in the judging of 58 entries was made at the annual dinner of the Academy held at Marquette University on May 4, 1956. The committee of judges included: J. M. CASKEY (Northland College), MARIANNA CHERRY (Milwaukee-Downer College), ROY J. CHRISTOPH (Carroll College), S. F. DARLING (Lawrence College), L. A. FRASER (University of Wisconsin), J. B. GREENE (Marquette University), ROBERT L. HENRY (Ripon College), and RALPH C. HUFFER (Beloit College).

The list of winners and titles of their scientific projects follow:

BOYS

Winfred L. Battig 2535 Elizabeth st., Sheboygan
"Monarch of the Air"

Eugene R. DeSombre 2517 N. 10th st., Sheboygan
"Graphing Absolute Quantities"

Thomas A. Ebert 502 Sixth street, Merrill
"Infrared Photography of Animals"

Neil R. Kestner 1443 S. 6th st., Milwaukee
"Theoretical Studies on Water"

Donald E. Knuth 7436 W. Caldwell ave., Milwaukee
"Number System Based on Pi"

John E. Kreznar 6451 N. 52nd st., Milwaukee
"New Viewpoints on Capillary Action"

Franklynn D. Peterson 930 Park Court, Port Edwards
"Reaction and Reaction Product of Hydrazine and Acrylonitrile"

Sidney R. Rautbort 3016 N. 49th st., Milwaukee
"Common Logarithmic Table on the Duodecimal System"

Robert Smallman 716 W. Columbia, Chippewa Falls
"Effect of Diethylstilbestrol and Thiamin on Growth of Tolmiea"

David J. Smith 211 Washington Blvd., Oshkosh
"Description of a Compass for Construction of Ellipses"

GIRLS

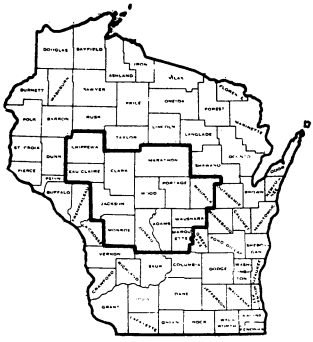
Frances E. Andrews 807 E. Juneau ave., Milwaukee
"Progressive Acidity in Milk"

Carol A. Joyce 503 W. Spring street, Appleton
"Experiments with Nuclear Emulsions"
Annamarie K. Kessler 2345 N. 88th st., Milwaukee
"Study of Structural Relationships and Differences in Blood"
Marjorie E. Lutzke Route 3, Merrill
"Study in Learning and Mental Association"
Ida L. Riendl 1009 S. Vine st., Marshfield
"Biochemistry of Cheese Making"
Sharon Rae Rudd 632 E. 5th st., New Richmond
"Oak Galls"
Mary L. Scudder 705 W. Bradley Road, Milwaukee
"Automobile Gasolines"
Sandra L. Treichel 1234 University Bay Dr.,Madison
"Groups"

The committee has surveyed the progress made by winners in the 1955 Wisconsin Science Talent Search and found that all thirteen winners continued their education at institutions of higher learning during 1955-56. Available data indicate that their records of achievement at these institutions validate the committee's selection of these young people as outstanding students. Most of them received scholarships or grants for their freshman year, but it is hoped that industries, individuals, foundations and professional societies in Wisconsin will see the value of financial assistance to deserving young scientists in the state and will make more awards available to the committee. A procedure for the selection of promising scientists from among Wisconsin high school seniors is available through the work of the Science Talent Search Committee, but implementation of the program in the form of tangible rewards to state winners is highly desirable.

# # #

OWNERSHIP OF CENTRAL WISCONSIN FOREST LANDS ---



Ownership class	Commercial forest land (Acres)
Federal	82,560
State	94,180
County & municipal	379,860
Farm	1,672,250
Large private	99,990
Small private	546,190
All ownerships	2,875,030

From TECHNICAL NOTES No. 451, April 1956, Lake States Forest Experiment Station, St. Paul 1, Minnesota

SEROLOGY AND PROGRESS

By Joseph G. Baier, Jr., Dean
Letters and Science, UW-M

Serology is the science of the study of blood serum. Blood serum is a particular fluid obtained from blood; that fluid which exudes from whole blood after it is permitted to clot. But, to define serology as such is not sufficient. The serologist is not particularly interested in the composition of blood serum per se, but, rather is interested in the reactions and interactions of special materials either normally found in, or which can be caused to be found in blood serum. In particular, he is interested in materials which we call antibodies, and those materials which can cause antibodies to be produced, that is, antigens.

Any foreign protein is antigenic to an animal. For example, the proteins of horse serum, the proteins of plant seeds, the toxins produced by certain bacteria, the venoms of snakes, are all antigenic to human beings, since they are proteins foreign to man. If these antigens are introduced into our bodies, by injection, we would react to them, (our cells would), and would produce specific antibodies to these proteins. We would become immunized to these proteins, that is, we would produce antibodies that would react with the antigens, and destroy them so that we would not be harmed by these proteins if they were harmful. And snake venoms and diphtheria toxins are harmful to man.

What are some of the specific contributions to man's progress from the field of serology? I suppose the study of the human blood groups is of first importance. The first of the many human blood groups was discovered in 1900 by Dr. Karl Landsteiner. Prior to 1900 a blood transfusion was given as a last resort when death was to occur anyway since it was known that transfusion accidents were frequent.

It was found that two naturally occurring antigens, protein A and protein B, were present in the red blood corpuscles of certain human beings, and two naturally

Summary of the Presidential Address delivered at Annual Dinner, 86th Academy meeting, Marquette University, Milwaukee, on May 4, 1956.

occurring antibodies, a and b were present in the blood plasma of certain human beings. As a result of the combinations of these four substances, four blood groups were observed. These groups were named according to the antigen distribution in the red blood corpuscles, as groups O, A, B and AB. Since the early discovery of these groups, it has been found that there are two different "A" substances, so that really one should speak of 6 groups, as O, A_1, A_2, B, A_1B, A_2B. Since each person has antibodies in his plasma for whatever antigens are not found in his corpuscles, it can be seen that in transfusion improper mixtures of antibody and antigen could occur. The serious problem here is that specific antibodies (for example a) will react with specific corpuscles (containing Antigen A) causing aggregation of corpuscles into clumps large enough to plug blood vessels and cause severe reactions which may lead to death. Antibodies of this type are called agglutinins.

With the knowledge of the A-B blood group series, the problems of transfusion were greatly clarified. But not entirely. In 1927 Landsteiner and Levine discovered the M-N series. In 1940 Landsteiner and Wiener discovered the RH series. In 1947 Montgomery discovered the S and Levine in 1951 the s factors. With our corpuscles containing the A and B antigens, and either M, N or MN, along with S, s, or Ss and either the Rh positive or negative antigens, with the Rh subtypes totaling 27 combinations (only 8 are ordinarily tested for), a total of several hundred combinations of antigens is possible in human bloods. But in addition to these blood groups, 17 others have been described, so that the combinations possible permit the existence of many millions of different human red blood corpuscles and therefore many millions of different types of human beings on the basis of their blood groups alone.

Of what value is a knowledge of the blood types besides that of transfusion care? It is now established that the blood groups do not change with age, and that they are inherited, with the mechanism known in most cases. Therefore, the blood groups are of importance in medico-legal applications. To mention a few examples, problems of relationship including disputed paternity may sometimes be solved by a knowledge of the blood groups of the child, the mother and the putative father. One cannot prove paternity, but one can permit exclusion of certain men as fathers of the child in question. As it is turning out, with the discovery of the many types of human red blood corpuscles, one can, on the basis of blood typing studies, detect an individual as surely by a study of his blood antigens as by the use of fingerprints. We are individuals based on differences in our blood type combinations alone.

Serology also includes the study of many other antibody-antigen systems. It includes the study of precipitins. Precipitins are a type of antibody, but, these antibodies are produced in an animal in response to the injection of a foreign fluid antigen. The serum of an animal so injected, when mixed in vitro with the type of fluid antigen used for injection purposes, will cause a visible precipitate to form.

Precipitins were discovered in 1897 by Rudolf Kraus. He had injected goats with sterile cholera, typhoid or plague culture filtrates. When the sera of the goats, so injected, were later mixed in vitro with these respective bacterial filtrates, a precipitate was produced. Bordet and Tchistovitch, working independently in 1899 found that proteins other than bacterial were antigenic and the field of study became greatly broadened.

Precipitins have many uses for man of both a practical and academic value. From the practical side, again medico-legal applications are evident. So delicate is the precipitin test, and so differentiating is it, that by proper use, it can become a detective of proteins. It can determine the kind of protein present on a knife, or any other instrument, which might have been used in carving a cow in the slaughter house, or a human being at the scene of a murder. Only a fraction of a drop of blood is required for the serologist to name the species of animal from which it came.

But, from its academic side, and of course, the more important aspect, precipitins are used to augment studies in taxonomy, the classification of animals and plants. The precipitin reaction is not strictly specific; the degree of precipitate formation for any given antiserum is dependent upon the similarity of the various protein antigens being studied. So, animals or plants can be studied serologically, and arranged in tables, or better "trees" of relationship, with those forms more closely related occupying positions on the tips of adjacent branches, while forms more distantly related, are connected only through branches which arise by division much farther down toward the trunk of the "tree."

Of the contributions to this field of study, the pioneer work of Nuttall in 1904 is outstanding. He reported some 16,000 tests in a monograph, "Blood Immunity and Blood Relationships." But this was only the beginning. Over the years the work has been extended and techniques have been refined. For example, the King Crab was shown to belong to the spider group by Graham-Smith in 1904 and removed from its former position with the crabs and lobsters. Wilhelmi gave further strength to the

Echinoderm theory of the ancestry of the vertebrates by his serological studies in 1942. And Boyden (1950) in studying the serum of the whale, found that these forms were more closely related to the Artiodactyla such as the cow and sheep than to any other order of existing mammals.

All studies indicate that the evolution of animals and plants can be correlated with an evolution of proteins. Perhaps some day the serologist will be able to define a species as including those animals (or plants) whose chemical composition (proteins, fats and carbohydrates) falls within a range of chemical similarity as determined by precipitins. When that day comes, one more concept of a species will be added to the already many.

We can see that serology, since its beginning around 1900, has had and will have a great influence upon man, not only directly upon his immediate life, a practical aspect, but also in terms of his thinking, an academic aspect. Progress in the latter of course is ahead of the former in most fields, but in serology, the practical value to man is most evident.

# # #

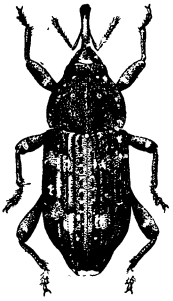
EDUCATION FOR WORLD FREEDOM

Speaking before the North Central Assn. of Colleges in Chicago on April 13, 1956, Vice-Pres. IRA L. BALDWIN (UW) said: "We want the unfree to know about our Constitution, our government, our economy, our way of life. Then we must be willing to study theirs. Actually, if we refuse to examine their ideas and ideals, we cannot hope to present ours in a way they can understand. . . . There are few universities, worthy of the name, that have not experienced, in recent years, the pressure of groups or individuals who misunderstand the role that freedom plays in education. The pressure builds particularly against the freedom of the scholar to follow the paths of his studies wherever they may lead, the freedom of students to form groups and to hear speakers of their choice, the need for source material on systems alien to our own. . . . And our educational system has found that freedom can be taught only by example. For only when educational freedoms exist can the great lesson of individual freedom be learned; the lesson that truth can combat falsity, that, as Lincoln put it, 'right makes might.'"

Education has two primary tasks in advancing world freedom, Baldwin said. "First it must define freedom to a world confused about its meaning. Second, it must equip free people to perfect the methods of freedom and to meet the challenges of world leadership."

THE USE AND EFFECT OF CHEMICALS IN CONTROL OF FOREST INSECTS AND DISEASES

By R. D. Shenefelt
Department of Entomology, UW



The use and future of chemicals in forestry practice is of much concern to conservationists. Consequently, it is worthwhile to take stock of our present situation. Because of certain quite striking differences in the use of chemicals for the control of insects and diseases, it seems best to treat the two separately.

A. Insects

To understand the need for and function of chemical control of insects, we must examine briefly the types of control available and their current status, know a little about the insects and the damage they are causing, and understand our current forest stands.

Five types of control are applied to forest insects. The first three are used primarily to prevent insect troubles and are called indirect or preventative controls. They are:

1. Legal control -- deals with quarantines, etc. and is used primarily to keep insects out of a region or to keep them from spreading. On the whole, this legal approach has been very effective -- although mention of the gypsy moth and other introduced forms might lead one to think the opposite. We never hear of the troubles which are avoided as a consequence of the operation of legal control.

2. Cultural control (in forest entomology called silvicultural)-- involves handling the forest in such a way that insects find the environment unfavorable and are unable to develop to epidemic numbers. This type includes sanitation, selective cutting of high risk trees, regulation of relative abundance of tree species and age classes, proper site selection, etc. Silvicultural control is designed, in part, to prevent establishment of conditions under which insects have caused severe damage in the past. The attempt is to grow an "insect proof" forest.

3. Biological control -- consists of utilizing natural enemies of insects to help keep their numbers down or lessen the severity and duration of attack. Biological agents include the predators (birds, rodents, Carabid beetles, etc.), parasites (ichneumon flies, etc.), and diseases (fungi, bacteria, viruses). This type of control is also concerned with development and utilization of strains of trees which can withstand insect attack.

Both silvicultural and biological control are designed to alter the environment of a pest species in such a way that it cannot increase its population drastically nor remain long at high numbers. The indirect types of control are more or less continuous and permanent once they are in operation.

* - Parts of a talk presented before the Wisconsin Society of Professional Conservationists at Stevens Point, March 10, 1956.

Factors which must be kept in mind regarding the insects are:

a. Insects are creatures of habit and are very specific in their responses. Once one knows how a given individual responds, he can predict quite accurately the response of the other members of the species. This knowledge is of utmost importance in developing and applying control methods. In other words, we need to know the biology and ecology of the insect.

b. The reproductive rate of insects is fantastic. They very quickly overwhelm an environment if conditions are favorable. For this reason, a constant watch must be kept upon the populations.

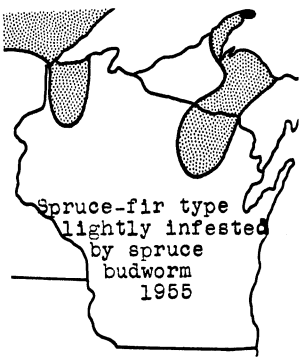
At present, we do not have sufficient information to be successful, in most cases, in utilizing the indirect methods. And often action of a curative nature must be taken. Insect populations may be so high that the crop will be lost unless immediate steps are taken. In such instances, we must rely upon direct controls, i.e., use either mechanical or chemical control.

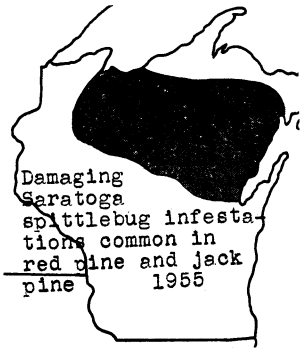
4. Mechanical controls are little utilized in the forest. Hand picking, application of heat, screening, and trapping are some of the methods included under this category.

5. In chemical control, an insecticide is used to kill the insects when they are in an exposed and susceptible stage.

The direct controls are temporary. They in no way change forest conditions responsible for the outbreak for the better, and are relatively costly. They are emergency measures only. Nevertheless, at the present time, it is only through the direct approach that we have sure types of control which provide immediate relief for our forests. The need for chemical control thus rests on a simple economic basis.

During recent years, the use of insecticides in the forest has increased rapidly. Between 1949 and 1954 over 6 million acres were treated for spruce budworm alone, and over 4 million were to be treated in 1955. We are now using considerable quantities of chemicals for insect control. The most commonly used is DDT but others are coming into more widespread usage. The potential use





of chemicals in our forests is rather difficult to estimate -- but there will probably be an increase in their use for some time to come and then a decline. The use of insecticides will grow until we gather the knowledge which will enable us to handle insect troubles before the epidemics arise.

The question, "What are the effects of applying insecticides in the forest?" is often asked. The first effect is that the trees are released from insect attack to continue production. The benefits are obvious. On the other hand, much information remains to be gathered on the effects of spraying on fish, wildlife, beneficial insects, soil organisms and on the forest plants. Conflicting experiences are not uncommon. Long range studies need to be undertaken to solve the problems involved.

In general, the use of insecticides is becoming safer and safer since toxic impurities are being eliminated and we are learning how to handle them better. Dosages are being reduced and their usage is becoming more and more specific. Tools for application are also becoming more reliable and exact. It should also be pointed out that few forest areas receive more than one or two applications of insecticide during a rotation period. The relatively low crop value and long rotation make it impossible to grow wood at a profit and spray it repeatedly.

B. Diseases

Professors Kuntz and Patton of the Plant Pathology Department emphasize that chemicals are being used very little for control of forest diseases. With pathogens, the idea involved in chemical control is to protect the plant from invasion -- not to directly kill the causative organism as is done with insects. This means maintenance of a protective chemical cover over the plant and renewal of that cover at periodic intervals. Consequently, the major emphasis has been placed on the indirect controls and will probably continue to be so placed.

At present, chemicals are not being used to any great extent to directly protect forest trees from diseases and they will probably not be used extensively for this purpose in the future. We simply cannot afford to spray a forest tree every ten days or two weeks.

In closing, perhaps we should call attention to the fact that both insect and disease problems on shade trees are handled quite differently than they are in the forest.

# # #

NORMAN CARTER FASSETT
(1900 - 1954)
Student and Teacher of Our Native Flora

While Chairman (1945-1950) of the Natural Areas Committee, he selected Parfrey's Glen as the first Scientific Area in Wisconsin
1956

Proposed text of a wooden memorial plaque to a distinguished former Academy member, to be erected soon at Parfrey's Glen in Sauk county.

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DOMAIN OF LETTERS

Academy member MAURICE R. HAAG writes from long practical experience as an authority on effective composition. Until his recent appointment to the Advertising Department of the American Scientific Laboratories, he served for a number of years as Managing Editor of Crops & Soils and as Editor of The Agronomy Journal.

Mrs. ANNE C. ROSE, Academy member, has for some time participated notably in Wisconsin regional writing activities. She has served as Historian of the Wisconsin Fellowship of Poets. Her home centers within the inspiring "dimension" of Gilmanton, Wis.

PRESENTING SCIENTIFIC INFORMATION TO THE LAY PUBLIC

By Maurice R. Haag
Madison

The technical worker, in particular the scientist, must from time to time discuss his specialty for the benefit of people who are not skilled in it. Ironically, though skilled in his own area of knowledge, he may be unskilled in handling the tools of communication. Thus his attempt to reach a lay audience may not be entirely successful.

Many things make communication of ideas ineffective. Often the difficulties might easily be avoided. They arise from faults which appear so repeatedly in manuscripts that editors have come to watch for them as a matter of routine. What are they?

Sentence length is the first problem. Among the marks of a good mind--and an educated mind--is the ability to think in long, involved thought patterns. Such complexities come forth in long sentences, with many qualifying words and phrases--a very natural way of expression as one becomes proficient in his field. But confronted with an intricate maze of technical thought, the lay reader is at a hopeless disadvantage. He simply lacks experience in working his way through to any clear understanding.

One of the first things, therefore, for the specialist to examine in his own writing for the public is the length of his sentences. Rarely are these short enough for the layman. For ease of grasp, sentences need to be kept within an average of 10 to 15 to 20 words. If such curtailment is difficult during the process of composing, the author should go back after the first draft and make it a separate job to shorten the sentences.

Paragraph length falls into this same category. Editors will have differing opinions on this matter; but for an average reader paragraphs ranging between 35 to 60 words in length offer perhaps best grasp. Two to three sentences per paragraph is a good average to work toward. The long, long complex sentence that takes up the full paragraph tends to lose clearness and certainly to lack force. Writer, beware!

Tying right in with this matter of sentence length is the question of word length. Educated people, presumably high in IQ,

use long words and big words because over a long period of time they have been adopting special terms and generally enlarging their vocabularies. Chances are that a specialist and the popular reading public will have in common only 1000 to 2000 words. The only way for him to carry meaning to them is by restriction to a shared terminology. Technical terms an author is compelled to use for lay readers should enjoy clear definition.

Scientific writers are often insistent upon using the abstruse words and concepts of their trade; they advance the argument that such esoteric terms are more exact. The trade term is not more exact if it means nothing to the audience.

My next point is word meaning. It is surprising how often writers hit upon a word which is slightly off-beat. For example, "visible" and "visual" mean two different things; yet they are sometimes used interchangeably. Make sure that you use the word which means exactly what you want it to say, not a word which approximates your meaning. The only recommendation on this point is: If in doubt, refer to a dictionary.

Somewhat akin to vagueness in words is what might be called dressing up an expression. Most of the time embellishment builds a fog around meaning, rather than making things clearer.

Here's what I am talking about. A farmer will always say that he plows his field. But the pretentious scientific writer comes up with: "The plowing of the field was accomplished."

A typical display word is "achieved". Many writers will say, "The plant achieved its growth," or "Growth was achieved." The normal way to say it is: "The plant grew." When you find yourself using these angularities, try saying them aloud and see whether they come naturally.

Scientific and technical writers tend toward use of the passive voice. There are some customs and traditions in scientific work which encourage the practice. But, again, remember that use of the passive weakens any construction. Stick to active voice if you can.

Violations of grammatical rules, and of actual logic, creep into much writing by technical people. A few common errors for the wary writer to avoid are these:

The split infinitive
(not always wrong, but sometimes suspect)
The pronoun which has no clear reference
("this" used alone is the most flagrant example)
The verb which doesn't agree with its subject
("He, with all his gadgets, were selected to carry out the test.")
The squinting modifier, or illogical arrangement
("They argued about wages for weeks.")
The dangling modifier, or misleading participial construction
("Looking back along the furrow, the plow was set too thin." "Looking" modifies logically the subject of the main statement; but surely "the plow" did not have eyes to "look". The writer manufactured this ambiguous construction; but many equally dubious examples intrude into writing. They can be ludicrous; watch out for them.)

Another practice which interferes with effectiveness is incorporation of unessential details. For example, the research method per se does not interest the ordinary person. The number of times a crop specialist replicates his plots has no value to the usual farmer. Significance in a statistical analysis means something to another specialist; it means little to anyone who has never taken a course in statistics.

Finally, many writers keep a discussion going long after they should have stopped. A common fault in scientific matter prepared for lay people is excess length. If you're writing for a specific publication, look over the articles it carries; keep yours within reasonable comformity with the publication's average.

The foregoing are only a few of the many things which stand in the way of effective communication. They are items which all of us tend to overlook when we are presenting materials to people unskilled in our particular trades. It is a continuing struggle to keep free from such failings. If we find ourselves poor critics of our own writing, let's enlist the help of some friendly--and frank--immediate, more or less experienced scrutinizer. He can catch the obscurities, double meanings, and downright errors we overlook.

# # #

A NOTE ON THE COVER PAINTING

"Of War and Peace" is the title of Aaron Bohrod's just completed painting which appears on this issue's cover. Another product of the current enthusiasm of the University's artist-in-residence: incisive still life painting, his symbols, aided by the title fall easily onto one side or the other of a contrapuntal theme.

For War we have the bayonets and antique gauntlet. And perhaps the letters of the battered child's building block do not only coincidentally stand for the Atom, for Hydrogen and for Cobalt. Nor does the mushroom point behind the block fail to reinforce the idea of an atomic explosion.

For Peace: a trilling alabaster bird, a cherub, a fish, a clarinet and artist's brushes. But the two Japanese girls might be just kids or they might be young versions of the Hiroshima maidens. Similarly the two boys might be just little boys, but also they wear military attire. Even the music appears to be not just any sheet of music. It is the torn front cover of Schubert's "Death and the Maiden."

Like most artists, Bohrod is loath to spell out every last element of the symbolism he injects into his painting. He says he is primarily interested in painting reality as well as he can. As for the symbolism involved--that is a spare string to his bow. The artist believes that within reason each spectator should extract whatever meaning he may from his works. -- The Editor

VILLAGE DIMENSION

Here all is heart-size. Gay and welcoming
The laughter sounds when lilting on to greet
Some guest, and strangers, pausing, sense that thing
Called friendship, blithe and warm where people meet.
Esteem to brim a heart is all the boon
They ask, these dwellers in the village places,
Who, walking in the golden suns of noon,
Wear joy and amity upon their faces.

Here mornings, calmly circling, ever bend
To shower peace, assuaging care and ills;
While on the little street the greetings blend,
Chiming in brightness over casement sills.
How clear the tokens are of friendship's worth
Conceived within a hamlet's heart-size girth!

---Mrs. Anne C. Rose

State and Academy News

NEWS NOTES FROM CARROLL COLLEGE

Collected by Prof. Roy J. Christoph (Review Reporter)

The internationally known Waukesha Symphony Orchestra under the musical direction of MILTON WEBER, Carroll music professor, closed its successful 1955-56 season with Moussorgsky-Ravel's "Pictures at an Exhibition" and a first performance of "A Dance Interlude" by Robert Crane of the UW music faculty. The year included five "home" concerts, a performance of Beethoven's "Ninth" in Milwaukee, a concert at Brookfield, Wis., a two-night artistic production of "Die Fledermaus", and a Young People and Children's concert. ... BENJAMIN RICHASON, Jr. will resume his teaching duties in the Dept. of Geography and Geology after a year's leave of absence studying at the University of Nebraska as a Danforth Scholar. ... ROY J. CHRISTOPH has been named chairman of the Dept. of Biology and will also serve during 1956-57 as chairman of the Wisconsin Science Talent Search. ... MILTON WEBER has been invited to serve on a country-wide committee of advisors to the National Music League to help select the top young concert soloists. ... Latest addition to the college's expanding physical plant and scheduled to open its doors in September is a new commons-union building housing cafeteria facilities for all resident students, a faculty dining room, ballroom, and certain offices for student affairs.

NEWS NOTES FROM MARQUETTE UNIVERSITY

Collected by Prof. Scott L. Kittsley (Review Reporter)

JOHN G. SURAK, asst. professor of chemistry, and new Academy member, was elected chairman of the Milwaukee section of the American Chemical society recently. He is also a member of the chemical education committee of that society. ... A new $25,600 RCA electron microscope was installed last spring at Marquette's Medical school. It resembles a silver oxygen tank and is mounted in the center of a double control panel. Largest model of its type manufactured by RCA, it is capable of magnification up to 300,000 times. Special note is made of dust-free conditions in the laboratory where it is located. This is achieved through air conditioning which allows maximum control over dust, temperature and humidity. ... Fr. JOHN P. O'BRIEN, C.S.V., associate professor of zoology, has been named a research associate of the Argonne National laboratory, Lamont, Ill., an AEC installation. He is also president of the Milwaukee Sigma Xi club, an organization of scientists on the doctoral level. On May 18, Fr. O'Brien addressed members of the Radiation Research society at their fourth annual meeting in Chicago. Radio-sensitivity of tissues in relation to their temperature at the time of exposure was his topic. ... Fr. LAWRENCE W. FRIEDRICH, S.J., director of the physics department, attended a conference in Chicago sponsored by the AAAS last spring, at which college science professors from five midwestern states discussed promotion of scientific careers at the college level. Together with Fr. E. J. O'DONNELL, S.J., president of Marquette, he also appeared on the program of the Southeastern Wisconsin Science Fair, sponsored jointly by Marquette and the Milwaukee Journal. ... FARRINGTON DANIELS, director of the UW Chemistry dept., spoke recently to a group of Sigma Gamma Chi and Marquette's chapter of the American Chemical society.

MISCELLANEOUS BOOKS AND BOOKLETS

Some recent miscellaneous booklets, leaflets and processed reports of interest to Wisconsin Academy members (and usually by members) are listed below:

"Wisconsin's Population - Changes and Prospects," by Professor DOUGLAS G. MARSHALL. Tech.Bull.194, Wis.Agr.Expt.Station, UW

"Landscape Plants That Invite Birds," by Professor G.W. LONGENECKER, Circ. 514, Coll. Agr., UW

"Nursery Tree Distribution and Tree Planting Report, 1955" by WILLIAM BRENER, Asst.Supt.Forests & Parks, W.C.D.

"Protecting Wisconsin's White Pine from Blister Rust," by T.F. KOUBA, Area Leader, Wis. Dept. Agr., Madison

"Insect Control in 1956" compiled by Professor E.H. FISHER and other members of UW Dept. Entomology, Circ.520, Coll.Agr.,Madison

UW Forestry Research Notes Nos. 28, 29 and 30 respectively: "Dying of Hard Maple in Central Wisconsin" by Professors J.E. KUNTZ and K.R. SHEA (UW Dept. Plant Pathology), "The Jack-Pine Budworm in Wisconsin in 1955" by JOHN C. DIXON, Professor DANIEL M. BENJAMIN and JOSEPH E. KAPLER of UW Dept. Entomology, Madison and"The Pine Tortoise Scale in Wisconsin" by P. A. JONES and Professor R. D. SHENEFELT, UW Dept. Entomology, Madison

"The Homing Salmon," by ARTHUR D. HASLER and JAMES A. LARSEN, reprint from the Scientific American for August, 1955.

"Diseases and Parasites in Wisconsin Birds and Mammals" by RUTH L. HINE, W.C.D., Madison (processed). Other recent W.C.D. publications include: "Forest Resources of Washburn County," "Annual Forest Fire Report - 1955" and "Annual Report - Forest Pest Conditions in Wisconsin - 1955"

"Indians of Wisconsin - A Reader's Guide to Standard References," by ROBERT L. HALL, State Historical Society, Madison

"Postmarked Hudson: The Letters of Sarah Andrews to Her Brother James Andrews, 1864-65," edited and compiled by WILLIS H. MILLER and available from The Star-Observer Publishing Co., Hudson. ($1.25)

"Geology and Ground Water Resources of Outagamie County, Wisconsin," by E. F. LeROUX, US Geol. Survey, in process of publication and manuscript copy available in offices of State Geologist, Science Hall, Madison

"Procedures for Investigation of Fish Kills" by Aquatic-Life Advisory Committee of the Ohio River Valley Water Sanitation Commission (414 Walnut st., Cincinnati, 2, Ohio - 50¢) of which W.C.D. Supt. of Fish Management EDWARD SCHNEBERGER is a member.

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HONORS AND AWARDS

WILLIAM J.P. ABERG, former Chairman of the Wisconsin Conservation Commission, recently was given the Broughton Conservation Award by the Wisconsin Chapter, Izaak Walton League of America. ... DON W. ANDERSON, publisher of the Wisconsin State Journal, won first place in Trans World Airlines 18th annual writing picture competition with his book, "It's Really Round." ... JOHN T. CURTIS will begin a year's leave of absence September first, sponsored jointly by the UW Research Committee and the John Simon Guggenheim Memorial Foundation through a Guggenheim Fellowship to write a book entitled "The Vegetation of Wisconsin," to be a complete account of the state's vegetation with great reliance upon the results of the past decade of research by the UW Plant Ecology Laboratory. ... RAYMOND J. ROARK, UW Professor of Mechanics, recently received the Benjamin Smith Reynolds Award of $1,000 for excellence in the teaching of future engineers. ... When HARTLEY H.T. JACKSON named the type specimen of the "Wisconsin Puma" recently, he honored Conservation Commissioner A. W. SCHORGER by calling it Felis concolor schorgeri

because of his successful efforts to preserve this specimen from destruction. ... UW English Professor HELEN C. WHITE recently won the Catholic Book Club's Campion Award for "long and distinguished service in the cause of Catholic letters." ... Professor JOHN VOZZA of the UW Racine Extension Center was awarded a research grant which will enable him to do chemical research on the Madison campus this summer. ... FRANK LLOYD WRIGHT, honorary member of the Wisconsin Academy, was honored at a party celebrating his 87th birthday on June 8.

ORGANIZATIONAL POSITIONS

THOMAS E. BRITTINGHAM,Jr., whose father was a Life member of the Wisconsin Academy, was recently named president of the Wisconsin Alumni Research Foundation. ... UW Professor C. A. ELVEHJEM is Chairman of the Food and Nutrition Board of the National Research Council. ... UW Professor JOHN T. EMLEN was elected President of the Wilson Ornithological Society last April. ... CHARLES D. GELATT (La Crosse), President of the UW Board of Regents, was recently reappointed for a nine year term. ... Professor JOSEPH J. HICKEY is the new editor of the Journal of Wildlife Management. ... Dr. ARNOLD S. JACKSON (Madison) has been named to the International Executive Council of the International College of Surgeons. ... HAROLD G. LIEBHERR (Beloit) is the new President of the Wisconsin Society for Ornithology. ... UW Professor of Botany HUGH ILTIS was recently elected to the Executive Council of the Central Section of the Botanical Society of America. ... W. C. McKERN is Editor-in-Chief of the Milwaukee Public Museum's publication Lore and two other Wisconsin Academy members, ALBERT M. FULLER and KENNETH MACARTHUR, are also on its Publications Committee as Chairman and Assistant Editor respectively. UW Engineering Professor WILLIAM R. MARSHALL, Jr. is a director of the American Institute of Chemical Engineers. ... HELEN MATHESON, Asst. Managing Editor of the Wisconsin State Journal, is Secretary-Treasurer of the Wisconsin Journalism Alumni Association. ... UW Professor LOWELL E. NOLAND is Council Representative for the UW Zeta Chapter of the Phi Sigma Biological Society. ... Former Governor OSCAR A. RENNEBOHM will continue as a Vice-President of the University of Wisconsin Foundation after relinquishing the presidency to FRANK V. BIRCH of Milwaukee. ... WALTER E. SCOTT was recently elected Vice-President of the Madison Chapter of the American Society for Public Administration. ... KIRK WHALEY is the new President of the Wisconsin Archeological Society. ... UW Professor HELEN C. WHITE was elected President of the American Association of University Professors last April.

MISCELLANEOUS NEWS

Professor DAVID BAERREIS is running a student archeological dig for the UW in South Dakota this summer. ... Professor WILLIAM GODFREY and WARREN WITTRY (Curator of Anthropology, Historical Society) are supervising a crew of Beloit College students excavating mounds in Menomonie this summer. ... The Wisconsin Archeological Society will hold its 1957 annual dinner meeting in Madison early in May in conjunction with the meeting of the Society of American Archeologists. ... Professor ALVIN THRONE (UW-M) is working this summer as naturalist for Mammoth Cave National Park in Kentucky. ... Mrs. MARGARET S. BERGSENG is now working with the Herbarium at the University of Illinois. ... MURL DEUSING'S African film has been prepared into nine telecasts for use on the NBC "Zoo Parade" program. Deusing is Curator of Education at the Milwaukee Public Museum. ... Miss S. JANICE KEE is the new Secretary of the Wisconsin Free Library Commission. ... AARON BOHROD is a member of the staff teaching painting at the UW Community Arts Workshop this summer. ... FIDELIA A. VAN ANTWERP is temporarily acting as editor

of the "Newsletter" for the Wisconsin Regional Writers' Association, Inc. The WRWA recently changed their name from "Rural" to "Regional" Writers.

ALVIN M. PETERSON of Onalaska has called attention to the excellent publicity given to the pasque flowers on the Midway (Wayona) Scientific Area in La Crosse county by the La Crosse Tribune this Spring. Almost a full page of space was used to explain the value of this area and the program of the State Board for the Preservation of Scientific Areas. ... The Wisconsin Alumni Research Foundation has dedicated a gift of $200,000 for the construction of a new 36-inch reflecting telescope, a main research laboratory and other buildings, and purchase a 40-acre hilltop west of Madison for use of the UW Astronomy Department.

In a recent talk before the Wisconsin Welfare Council, Miss IONE A. NELSON, Public Library Consultant of the Free Library Commission Staff, reported that in spite of 315 public libraries located throughout Wisconsin, "only one-half of the State's population has reasonably good library service. ... Over 1,000,000 or 30% of Wisconsin's people, are served by very poorly supported libraries. The remaining 20%, or 650,000 people, do not have any public library service...." ... The entire June issue of the Wood-Worker, national trade magazine of the wood-working industry, was devoted to the research accomplishments and personnel of the U.S. Forest Products Laboratory at Madison. ... According to a recent bulletin from the U.S. Office of Education entitled, "Statistics of Higher Education: Faculty, Students and Degrees, 1951-52," there are 65 institutions of higher education in Wisconsin of all types. Of these, the 35 publicly controlled include one university, 10 teachers colleges, one professional school and 23 junior colleges. The 30 privately controlled include one university, 15 liberal arts colleges, 3 teachers colleges, one technological school, 4 theological schools, 3 other professional schools and 3 junior colleges. Total students at these institutions that year were reported to be 43,566.

The site of the present Wisconsin State College in Milwaukee will be the permanent site for the UW-M according to a decision of the Board of Regents. The downtown campus also will be retained for the present. The 1956-57 budget anticipates spending $3,644,193 for all operations at the UW-M for the fiscal year beginning July 1. ... For the 1956-57 year the gross budget for all UW activities throughout the state totals $42,558,954 and provides for a combined enrollment estimated at 22,858. ... A two-year UW building program for the 1957-59 biennium is estimated at $26,566,000 of which $5,146,000 will be facilities at the UW-M. This includes a two million dollar Science building at Milwaukee.

# # #

ACKNOWLEDGMENTS

In addition to acknowledgments mentioned elsewhere: Photo by Gary Schulz on p. 105 with permission of The Wisconsin State Journal from May 14, 1956 issue; white pine weevil sketch, p. 115, from leaflet, "Important Tree Pests of the Northeast,1952" and insect distribution maps pp. 115-117 from "The Forest Insect Situation, Lake States 1955" by L. C. Beckwith and H. G. Ewan, Lake States Forest Experiment Station, USFS, Station Paper No. 35, Jan. 1956; illustrations for page 121 are from the "Wisconsin Century Book" (1948) for the landscape view and St. Nicholas Magazine of August 1880 for the village scene; photo of Charles Sage on p. 134 is by Harris and Ewing of Washington, D. C. (copyrighted); picture of Edward A. Birge on p. 136 from "The Badger 1926" and photo of Edward M. Gilbert on p. 140 by Harold N. Hone. # # #

THE ACADEMY'S 86TH ANNUAL MEETING

(Milwaukee, May 4-5, 1956)

By R. J. Dicke, Secy.-Treas.

The 86th Annual Meeting of the Wisconsin Academy convened in the Ball Room at Brooks Memorial Union of Marquette University in Milwaukee on May 4, 1956. Papers covered a wide range of subjects both in science and the humanities. The program for the two-day session is reproduced on page 144 of this issue. On Saturday, May 5, the Junior Academy of Science also held a day-long meeting. Several of the papers presented will be carried in the Review during the course of the next year.

Following an informal reception for members and guests, the Annual Academy Dinner was held in the Pere Marquette Faculty Dining Room of Brooks Memorial Union. Toastmaster for the event was one of our past presidents, HENRY A. SCHUETTE. Announcement of the winners of the Wisconsin Science Talent Search was made by ROY J. CHRISTOPH, chairman of the committee (see p. 109). President JOSEPH G. BAIER, Jr. told of "Serology and Progress" in his presidential address (see summary on page 111) and Rev. EDWARD J. DRUMMOND, S.J., Academic Vice-President of Marquette University, gave his views on "Science and the Humanities" in the banquet address. Rev. Drummond's talk will appear in the Fall issue of the Review.

ANNUAL BUSINESS MEETING

The Annual Business Meeting was called to order by President JOSEPH G. BAIER, Jr. at 4:15 p.m., May 4, 1956 in Brooks Memorial Union at Marquette University. Minutes of the last meeting were read and approved.

The following reports were read and approved:

1. Treasurer's report (p. 142-3) by the Secretary-Treasurer.
2. Membership report (p. 128)
3. A report by J. W. THOMSON, Jr. on the Wisconsin Junior Academy of Science.
4. A report by W. E. SCOTT on future plans for publication of the Wisconsin Academy Review.
5. The Resolutions Committee, composed of KATHERINE G. NELSON, HENRY A. SCHUETTE and RUTH I. WALKER, presented three resolutions which were passed unanimously (p. 127). (Editor's Note: A standing vote of thanks was accorded retiring Secretary-Treasurer R. J. DICKE for his six years of service.)
6. A report by the Nominations Committee for the following slate of officers for the year 1956-57:

President: STEPHEN F. DARLING, Lawrence College, Appleton
Vice-President (Sciences): RAYMOND H. REIS, Marquette Univ.
Vice-President (Arts): FREDERICK M. LOGAN, Univ. of Wisconsin
Vice-President (Letters): CHARLES G. CURTIS, Beloit College
Secretary-Treasurer: FRANCIS D. HOLE, Univ. of Wisconsin
Librarian: GILBERT H. DOANE, Univ. of Wisconsin
Rep. on Council of AAAS: FRANCIS D. HOLE, Univ. of Wisconsin
Committees: Publications - The President and Secretary, ex officio, and JAMES A. LARSEN, Univ. of Wisconsin
Membership - The Secretary, ex officio, C. L. FLUKE, DON SCHLAFKE, WALTER SYLVESTER, and JAMES C. PERRY, chairman.

A unanimous vote was cast for the entire slate of officers proposed by the committee, R. H. IRRMANN, A. W. SCHORGER, C. L. FLUKE, Chm.

Procedure for election of officers was discussed by C.L. FLUKE and a motion was made and passed to appoint a committee to study and propose procedure for future elections.

The meeting was then turned over to President-elect STEPHEN F. DARLING, and adjourned at 5:05 p.m.

RESOLUTIONS

I.

WHEREAS: The Wisconsin Academy of Sciences, Arts and Letters has lost in death nine of its distinguished members during the year 1955-56, and

WHEREAS: The Academy wishes to recognize its indebtedness for their inspiration, devotion and leadership,

BE IT RESOLVED: That the Wisconsin Academy of Sciences, Arts and Letters herewith express its lasting appreciation for service given throughout the years by:

DAVID C. EVEREST	FRED R. JONES
EDWARD M. GILBERT	RUTH MARSHALL
JOHN C. HAWLEY	LOWELL S. MILLER
CHESTER A. HERRICK	BURTON R. PIERCE

JOHN E. POTZGER

BE IT FURTHER RESOLVED: That a copy of this Resolution be inscribed in the official minutes of the organization.

II.

WHEREAS: The Wisconsin Academy of Sciences, Arts and Letters has enjoyed a successful 86th Annual Meeting at Marquette University, as a part of Marquette's 75th Anniversary celebration,

BE IT RESOLVED: That the Academy expresses congratulations to Marquette University on its record of scholarship and service during the past 75 years, and its best wishes for an illustrious future, and

BE IT FURTHER RESOLVED: That the Secretary be instructed to express our appreciation and thanks to our colleagues of Marquette University and its administration for their generous hospitality.

III.

WHEREAS, ROBERT J. DICKE has served the Wisconsin Academy of Sciences, Arts and Letters faithfully and well, as Secretary-Treasurer and Editor during the past six years, and is now leaving that office,

BE IT RESOLVED: That the Academy expresses its gratitude for his years of unselfish activity.

Respectfully submitted:
RUTH I. WALKER
KATHERINE G. NELSON
HENRY A. SCHUETTE
Resolutions Committee.

COUNCIL MEETING

Nine Council members, the Editor of the Review, and the Chm. of the Junior Academy met during the noon hour on May 4, 1956. Minutes of the last meeting were read and approved. A resolution was passed that henceforth all donations made to the Academy must be presented to the Council for acceptance; those from C.M. GOETHE and KOERPER ENGRG.ASSOC. were accepted. The Nominations Comm. report was discussed and accepted. Policy regarding continuation of Family Memberships was discussed and referred to a committee for action.

MEMBERSHIP REPORT

Fiscal year ending:	1952	1953	1954	1955	1956
Patron	-	-	-	3	3
Life	35	34	34	32	31
Sustaining	-	-	-	6	9
Active	327	332	391	551	635
Library	-	-	3	16	19
Corresponding	10	11	10	10	3
Honorary	5	4	4	4	4
TOTALS	377	381	444	622	704

DECEASED MEMBERS: David C. Everest, Edward M. Gilbert, John C. Hawley, Chester A. Herrick, Fred R. Jones, Ruth Marshall, Lowell S. Miller, Burton R. Pierce, and John E. Potzger.

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NEW MEMBERS

Forty applications for Active membership and three for Sustaining membership have been received since the Council meeting:

Sustaining - ANNIE LAURIE BUCKSTAFF (formerly Family member)
CHARLES D. STEWART, Author, Hartford
W. E. WAGENER, Attorney, Sturgeon Bay

Active - JOHN L. ADAMS, Univ. of Wis., Madison
ARNOLD BAKKEN, Wis. State College, Eau Claire
ARTHUR G. BARKOW, Marquette Univ., Milwaukee
JOHN W. BARNES, Wis. State College, Stevens Point
SISTER M. CELESTE, O.P., Dominican College, Racine
LEE DOUGLAS, Writer, Wood
RONALD L. GIESE, Milwaukee
ROBERT GLECKNER, Univ. of Wis., Madison
WILLIAM B. HILDEBRAND, M.D., Menasha
ANDREW W. HOPKINS, UW Emeritus Prof., Madison
Mrs. CLARA HUSSONG, Nature writer, Green Bay
R. P. HUSSONG, Equip. Supt.,Standard Oil, Green Bay
HERMANN L. KARL, Marquette Univ., Milwaukee
Mrs. H. L. KARL, Milwaukee
WILLIAM J. KATZ, Chem, & Sanitary Engineer, Milwaukee
JOSEPH W. KENNY, Univ. of Wis.-Milwaukee, Milwaukee
ARTHUR R. KOCH, Consumer Finance Co., Lake Geneva
ERHARDT C. KOERPER, Consulting Engr., Milwaukee
PAUL LICHTENSTEIN, Univ. of Wis., Madison
Rev. M. J. McKEOUGH, O.P., St.Norbert Coll.,West DePere
MENAHEM MANSOOR, Univ. of Wis., Madison
JOHN L. MARGRAVE, Univ. of Wis., Madison
Miss LOUISE MARSTON, Journalist, Madison
Mrs. EDNA K. MEUDT, Author, Dodgeville
NEAL E. MINSHALL, Hydraulic Engr., Madison
GUILBERT L. PIPER, Agriculturist, Racine
I.C.M. PLACE, Univ. of Wis., Madison
KENNETH B. RAPER, Univ. of Wis., Madison
Mrs. ANNE C. ROSE, Creative writer, Gilmanton
KERLIN M. SEITZ, Univ. of Wis.-Milwaukee, Milwaukee
JOHN JAMES STOLTENBERG, Tool engineer, Elkhart Lake
JOHN G. SURAK, Marquette Univ., Milwaukee
ROBERT TAYLOR, Univ. of Wis., Madison
DANIEL Q. THOMPSON, Ripon College
SISTER M. VALERIAN, Regis High School, Eau Claire
NORBERT VETTE, Outdoor writer-Ecologist, Oshkosh
Mrs. NORBERT VETTE, Oshkosh
ROBERT C. WILKINSON, Jr., Entomologist, Middleton
PERRY W. WILSON, Univ. of Wis., Madison
FRANK ZEIDLER, Mayor, City of Milwaukee

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JUNIOR ACADEMY NEWS

By John W. Thomson, Jr., Chairman
Junior Academy Committee

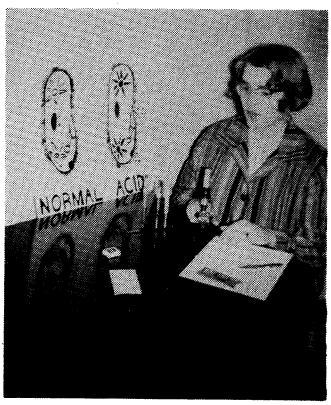
The Statewide meeting with the Wisconsin Academy of Sciences, Arts and Letters held at Marquette University on May 5 was attended by about 55 people, including senior academy members. Awards of nomination for membership in the national scientific organization, The American Assn. for the Advancement of Science, were voted to GARY KAZIUKEWICZ, De Padua High, Ashland and CAROLYN EWALD, Appleton Senior High. Among the privileges accorded these winners will be Science Newsletter and Scientific Monthly for a year. Selected for membership in the Wisconsin Academy of Sciences, Arts and Letters were: STEVE ROSOLAK, Regis High, Eau Claire; DAVID PLATZ, Aquinas High, La Crosse; DAVID KREY, Reedsburg High, FRANKLYNN PETERSON,* John Edwards High, Port Edwards; IDA LOUISE RIENDL,* Columbus High, Marshfield; TOM CORBETT,* Appleton Senior High; JAMES SCHLEIS and LARRY SCHUMACHER, Lincoln High, Manitowoc, DONALD KNUTH,* Milwaukee Lutheran High; RICHARD RAPPL,* Messmer High, Milwaukee; and RAY W. STUBBS,* Washington High, Milwaukee. Awards of a wide choice of scientific magazines were carried by those starred while others were awarded a lesser choice of science magazines. A citation for the most original work presented was earned by DONALD KNUTH for his paper on "The Potrzebie System of Weights and Measures." Awards on the program were made possible by Academy member C. M. GOETHE. The judges at the meeting were ERNEST A. BELLIS, Wis. State College, Milwaukee and JOHN McCLYMONT and Mrs. A. P. JONES of Milwaukee-Downer College. Co-Presidents of the Junior Academy elected at the annual meeting are CAROLYN EWALD, Appleton Senior High, and ROBERT ADLER, Columbus High, Marshfield.

The Junior High School Statewide meeting held at West High School, Madison, on May 19, 1956 under the sponsorship of the West High Science Club was attended by about 180 people. So many papers were contributed this year that two sessions were run simultaneously during the morning, a Radio and Electronics Section and a General Science Section. Those selected as winners of awards of science magazine subscriptions for outstanding work were: BILL KARNER, Bradford High, Stevens Point; TIM HULICK, St. Joseph Cathedral School, La Crosse; JACK KISSLINGER, SIMON LEWENSTEIN and GARY WILLECKE, Wilson Junior High, Appleton; CHARLES BLAIR, Wausau Jr. High; BILL PRESLAN, Lincoln Jr. High, Kenosha; CYNTHIA CANTWELL, Campus School, Wis. State College, La Crosse; SUSAN ARMSTRONG, and EDWARD CARBERRY, Nicolet High, Milwaukee; BARBARA BACH and MARY ARENT, McKinley Jr. High, Kenosha; LEE PETERMAN, Merrill Jr. High; DALE REIMER, Washington Jr. High, Kenosha, and DAVID LULAS, Bradford High, Stevens Point. Honorable mention for excellent projects presented was accorded to STEVEN J. LEFEURE, Wilson Jr. High, Appleton; PETER EVERSOLE, Campus School, Wis. State College, La Crosse; TOM GREGORY, Nicolet High, Milwaukee; CLARENCE MALICK, Bradford High, Stevens Point; JAMES LUNDBERG, and DIANE CROOK, McKinley Jr. High, Kenosha; MONTOUR BECK and CARMEN DUFFY, Campus School, Wis. State College, La Crosse. HENRY G. KOEHLER, GORDON BURGESS and DALE WESNBERG of West High, Madison, and O. G. SMESTAD, Lincoln High, Beloit, served as the judging committee.

Two long-time supporters of the Junior Academy were lost by death during the past year. EDWARD M. GILBERT (see p.140) died in April and BURTON PIERCE of Bradford High, Stevens Point, died last November. Mr. Pierce served many years on local committees and on the state committee of the Junior Academy. We regret deeply the loss of these men.

PROTOZOAN REACTIONS

By Carolyn Ewald
Appleton Senior High School



Although I have always been interested in all kinds of animals, I was unfamiliar with the one-celled, or protozoan, varieties until this year. My work was mostly with Paramecium, protozoans which are numerous and easy to care for. I soon discovered that an animal of this family is easily attracted to bits of plant life in its culture of pond water, for paramecium feed upon green plant life. In all my experiments, I added the test substance to a drop of protozoa; I did not actually culture the animals in the substance.

Acids from our chemistry lab were easily obtained, and caused death within a few seconds. I used concentrated, 1-to-500 dilutions, and 1-to-250,000 dilutions of hydrochloric, sulphuric, and glacial acetic acids. I also experimented with canned orange and grapefruit juice, and found that the animals are paralyzed either due to the great density of the juice, or because of the citric acid it contains.

Concentrated eythl alcohol (pH 4.5) caused instant death, but a 1-to-10 dilution (pH 5.0) speeded up the movement and body processes of the paramecium and killed them in approximately the same way as did the acids. With both the acid and alcohol deaths, a violent contraction of the vacuoles occurred just before the animals expired. Sulphide liquor, a waste product of many paper mills, caused instant death. Sulphide liquor (pH 2.5) is extremely acid, but by the time it was diluted to the strength it normally has in the Fox River (1 part sulphide liquor to 1,000,000 parts water) it had no effect upon the protozoa.

While cleaning some lab equipment, I accidentally dropped some scouring powder on a slide containing paramecium. The paramecium were very definitely repelled by the powder (pH 9.5) and died within a few seconds after contact. Death caused by this alkaline substance was almost identical to death caused by acids.

I ran several electrical experiments and discovered that paramecium are attracted to the negative side when an electric current is passed through a drop of their culture medium. I would like to make further tests along this line in the future.

My latest work has been with pH of protozoan cultures. There are many factors to consider in tests of this sort: light variations, temperature changes, plant life content of the water, etc., but at present I am working only with changes of pH in relation to the forms of animal life in the culture. My culture contained ordinary river water which had been exposed to light and air, and "seeded" with infusorian powder. After two days had passed, the culture had a pH of 6.0, and contained a few paramecium, many forms

of algae, and a few small worms. By the sixth day, the culture contained many medium-sized paramecia, and a few types of algae. The six-day culture had a pH of 6.3. On the ninth day, the culture had a pH of 6.5, and was composed of large paramecia and a few rotifers. On the 14th day, the culture's pH was 6.7. The rotifers had completely demolished the ranks of the paramecia, and a few Volvox had appeared. By the 16th day, the culture contained forms which have chlorophyll, and can therefore make their own food. The pH had risen to 6.8. The culture, on the 20th day, had a pH of 6.9 and still contained only forms of plant-like animals or animal-like plants which can make their own food. By the 24th day, the last day I have on record, the culture's pH had risen to 7.0 and Vorticella and its relatives had appeared.

In the future, I would like to continue with my pH of culture experiments, and perhaps do some research on the effects of light, heat, and infra-red rays on those little blobs of living matter: protozoa.

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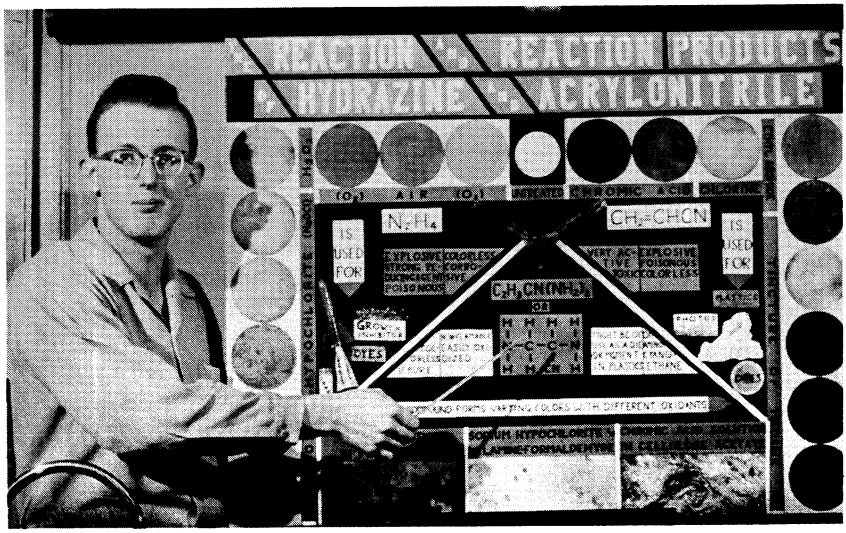
THE REACTION AND REACTION PRODUCTS OF HYDRAZINE AND ACRYLONITRILE

By Franklynn Peterson
John Edwards High School, Port Edwards

This project consisted of research involving two rather new chemicals: hydrazine (N_2H_4) and acrylonitrile ($CH_2{=}CHCN$). All of my research was done in my own laboratory, and is, so far as I can determine, completely original.

My reaction of equal molecular quantities of hydrazine and acrylonitrile forms a colorless liquid. This liquid, however, reacts with many other chemicals to form a seemingly unlimited array of colors, shades of colors, and combinations of colors.



A few chemicals I have tested with my reaction product thus far, and their respective colors, include: hydrogen peroxide--yellows, browns; tinctures of iodine--browns, violets, black; ethyl bromide--yellows, reds, greys; chromic acid--greys, greens; titanium tetrachloride--yellows, reds, browns, greens, black.

Certainly a chemical which can produce so many interesting color effects should be of some value as a dye or pigment. The field of plastics, I have found, might be able to put these hydrazine-acrylonitrile dyes to good use.

On the bottom of the display in the accompanying photograph are three samples of plastics which I have colored using my original dyes. Each sample contains at least three different colors. Present commercial methods would have required me to use a separate batch of plastic for each color. I colored my plastics by mixing some of the reaction product of hydrazine and acrylonitrile with one batch of plastic and then adding one or more of the color producing chemicals. If a similar process were used in commercial plastic operations, cost and time could be greatly reduced.

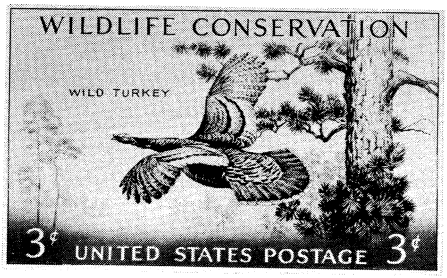
Research into this reaction and the resulting products is far from complete. Much is yet to be learned about the chemical reactions taking place and the stability of the resulting colors. When this research is completed, it is quite likely that a commercially useful series of dyes and pigments may result.

(This report gives only very simple and general information. Persons interested in a copy of the full 12-page report may write to: Franklynn Peterson, Box 190, Port Edwards, Wisconsin.)

# # #

GIFTS TO ACADEMY:

Gifts received since closing of the books for the fiscal year include $10 from KOERPER ENGINEERING ASSOCIATES for Junior Academy prizes and $20 from C. M. GOETHE to purchase wild turkey postage stamps for use on Academy mail. Also in the nature of a gift was the renewal of his patron membership of $75 by RALPH N. BUCKSTAFF.



Design of the wild turkey stamp reproduced here from an official photograph was originated by BOB HINES of the Fish & Wildlife Service. It is the first time a wildlife design has been used on a U.S. postage stamp and is of particular interest to Wisconsinites because it was first released at Fond du Lac on May 5, 1956 in connection with the convention of the Wisconsin Federation of Stamp Clubs. Significantly, wild turkey were at one time found in that vicinity, according to historical and archeological records.

LUCILE EVANS SWENDSEN—BIOLOGIST

A Retirement Profile

An active and colorful teaching career came to a close for Mrs. LUCILE EVANS SWENDSEN on July 1. For 35 years she has taught biology courses, 27 of these years at Wisconsin State College, Milwaukee. Her enthusiasm for the teaching as well as the subject matter of her field has been of considerable inspiration to many former students, most of whom are now in the teaching profession.

Mrs. Swendsen was born in Ada, Michigan on August 18, 1896. Most of her life, however, was spent in Milwaukee, Wisconsin. She attended West Division High School and the Milwaukee-Downer Seminary, where she received an A.B. degree in 1920. Graduate study took her to the campus of the University of Chicago from which she received an M.S. degree in 1925. Further graduate work was undertaken at the University of Chicago and Marquette University.

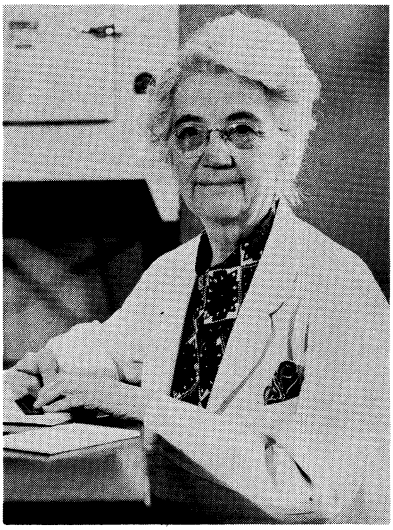
Her teaching experiences in biology began in 1920 at the Wausau High School. After a three year term at Wausau she taught at the Oshkosh High School for five years and became the chairman of the biology department. In 1929 she accepted a position at the State Teachers College, Milwaukee. She has observed this latter school change to a State College and on the eve of her departure is viewing it change to the University of Wisconsin--Milwaukee.

In addition to teaching, Mrs. Swendsen was also interested in many local, state and national educational and scientific organizations. A member of the Wisconsin Academy of Sciences, Arts and Letters since 1932, she has served as a judge of Junior Academy talent contests. Other organizations with which she was affiliated include: American Fern Society, American Nature Society, Sullivant Moss Society, Botanical Society of America, Wisconsin Society for Ornithology, Milwaukee Audubon Society, Wisconsin Iris Society, Milwaukee Society of Entomology, Wisconsin Education Association, National Education Association and the National Association of Biology Teachers. In the last named organization she held the offices of first and second vice president, national membership chairman and state membership chairman. Mrs. Swendsen also found time to be active in church work and served as advisor to the Inter-Varsity Christian Fellowship organization on the W.S.C. campus.

Retirement will not mean inactivity for Mrs. Swendsen. Together with her husband, Harold, she plans to make Vallejo, Calif. her home and besides visiting her many friends, anticipates an active avocation in horticulture. -- Peter J. Salamun.

HELEN T. PARSONS—NUTRITIONIST

A UW Retirement Profile



In nearly 40 years at the University of Wisconsin, HELEN T. PARSONS directed and planned much of the nutrition research in the School of Home Economics. Much of her work has been with foods that interfere with the use of vitamins by human beings. Her studies revealed that raw bakers' yeast interfered with thiamine and raw egg white had a similar effect on biotin. She has received the research award of the American Home Economics Assn. for the "fundamental nature of her work. ..." A home economics graduate of Kansas State College, she taught in Oklahoma, then came to Wisconsin where she received her master's degree, later taking her Ph.D. at Yale University. She has kept up her membership and interest in some 20 professional and honorary organizations. A member of the Academy since 1929, she has also been associated with such groups as the Institute of Nutrition, American Society of Biological Chemists, American Dietetics Assn. and American Home Economics Assn.

CHARLES H. SAGE—INDUSTRIALIST

A Retirement Profile

After more than 48 years of service in Kimberly-Clark where he started as a mail and messenger boy, CHARLES H. SAGE, a vice president of the company since 1937 and president of Spruce Falls Power and Paper company of Kapuskasing since 1942, retired January 7. He will continue as a director of both companies. He had held several other positions of importance with lumber and paper and pulp companies and their associated organizations both in the United States and Canada. He was also chairman of the United States Forest Industries Council and a trustee of the American Forest History Foundation. He has been affiliated with the Academy since 1954. --- Excerpt from COOPERATION, Jan.Feb. 1956, published by Kimberly-Clark Corporation

THE BOOKSHELF

E. A. BIRGE—A MEMOIR
By G. C. Sellery

Including AN EXPLORER OF LAKES
By C. H. Mortimer

The Univ. of Wisconsin Press
811 State street
Madison 5, Wisconsin
1956 - $3.50

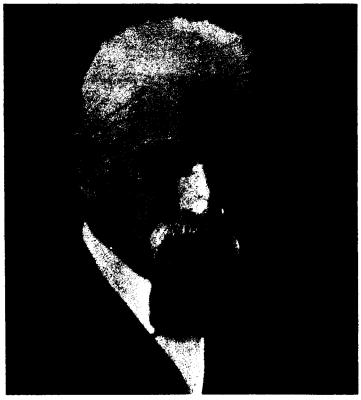
Entrenched though his memory is at Wisconsin, to the rest of the world Edward A. Birge remains an obscure genius who laid the larger foundation stones of a science familiar to every sportsman, though perhaps not by name. Limnology was his science, the study of lakes and streams and the life within them, a science which forms the basis for today's skillful management of freshwater resources by departments of conservation throughout the world.

In his early years, Birge was too busy gathering facts to write more than technical papers about his work; in his middle years he was occupied with the University presidency; in his later years (he lived to be 98) there was too great a need to organize the information he had gathered to write much about it. A few essays remain, gathering dust in the University's collection of "Birge Papers," and these are the only non-technical expressions existing to describe the work that virtually created a new science.

The book concerns the intellectual history of a complex individual who helped raise a university to a place of distinction among those of the world, and at the same time carved an enduring place for himself in the history of science. It is not an internal biography; Birge's thoughts, motives, and feelings are untouched and untampered with except as he gave them written expression and are left for the reader to discern. But Birge's growth is recorded, from historical evidence available and through the words of those who knew him. His early education, frail physique, and intellectual interests are dealt with; his training under Mark Hopkins and Louis Agassiz themselves; and his maturation in the academic and political worlds.

Not a narrow genius, Birge served as adviser and lieutenant to two UW presidents who preceded him; he tackled the problems of the humanities in a world of science; he tangled with William Jennings Bryan on the issue of evolution; he defended academic freedom on many an occasion, and particularly Eugene Debs' right to be heard on public platforms; and he delivered a famous series of 13 sermons, one a year, on the subject of St. Paul, in the local Episcopal Church.

At the same time, Birge and a long succession of fellow-scientists, of whom Chancey Juday was most notable among them, worked



to discern the enormously complex ecological structure of the life in Wisconsin's lakes. When Birge started his lake work, he first studied in the most intimate detail the tiny, free-swimming or floating plants and animals that form the base of the food-chain in lakes. He and his colleagues discerned the outlines of the entire framework of action and reaction upon which the webs of life are based. They were among the first--if not first--to take one web apart to see what made it tick. They demonstrated that each bit of life is part of an incredibly complex system, tied to earth and sun; each species (and each individual) is irrevocably tied to every other, yet all are forced apart by competition and the necessities of predation. The nearly unbelievable quantity of information collected by Birge and Juday has found many applications in the biological profession of lake management. It has also contributed much to our basic knowledge of life as studied in the science of ecology. Birge's "water-cosmos" is possibly still the best-understood of the many webs-of-life to be found in this wide and varied earth of ours. --- James A. Larsen.

(Editor's Note: Edward A. Birge was President of the Wisconsin Academy of Sciences, Arts and Letters at the time of its fiftieth anniversary (1920) and did much of the planning for that memorable event. He also held Wisconsin positions as Secretary of the Commissioners of Fisheries; Director, Superintendent and President of the Geological and Natural History Survey; and member of the State Board of Forestry, Conservation Commission and Free Library Comm.)

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EXPLORATIONS IN AMERICA BEFORE COLUMBUS
By Hjalmar R. Holand

Twayne Publishers, Inc.
New York City
1956 $6.00

(Review reprinted with permission from Buffalo Courier Express, issue of April 22, 1956.)

This is a most fascinating work, not only because of its subject matter, but also for the interesting manner in which it is presented. It is both excellent history and marvelous geographical detective work.

Holand asks: When does American history begin? He points out centuries before Columbus Norse seafarers had crossed and recrossed the Western Ocean many times.

For almost the next four centuries the Norsemen continued their visits, and their cartographical details trickled through all the courts of Europe and supplied the bulk of the data on which Columbus based his great voyage.

The Kensington Stone and the Newport Tower are discussed adequately and interestingly. The book is profusely illustrated.

\- - -

THE STORY OF THE TOWER: THE TREE THAT ESCAPED THE CROWDED FOREST
By Frank Lloyd Wright

Horizon Publishing Co.
1956 $6.00

Review by Miles G. McNamara reprinted with permission from Milwaukee Journal, issue of April 22, 1956.

Frank Lloyd Wright has had to live considerably longer than most men--waiting for the rest of America to catch up with his ideas so that he can put them into concrete form.

The story of one such idea, a 19 level skyscraper with each floor cantilevered from a central shaft, like the branch of a tree from its trunk, is told in the Wisconsin architect's own words and a series of photographs in "The Story of the Tower."

All of Wright's writings on this subject, including much previously published, are printed. Then 130 illustrations, six of them in color, show the growth of the building from Wright's original drawing in 1929 to the actual, completed project. The building, owned by the H. C. Price Co., is in Bartlesville, Okla.

- - -

PLANT ECOLOGY WORKBOOK
By J. T. Curtis

Burgess Publishing Co.
426 S. 6th street
Minneapolis 15, Minn.
1956 $3.25

This newly revised workbook, the first edition of which has been used in plant ecology classes since 1924, contains several new features including: (1) maps of actual plant communities for practice in sampling vegetation; (2) field work exercises including the effects of fire and grazing on forest and grassland vegetation and (3) keys for winter and summer conditions for the identification of stump woods, trees, shrubs and prairie grasses in the North Central States region.

Other sections contain winter laboratory exercises, maps of vegetation and soils, conversion tables of common ecological constants and a guide to ecological literature for a survey of the various phases of modern plant ecology. In addition to 86 pages of text are a number of "Hardwood Forest Data Sheets" for use in field studies.

Academy member J. T. CURTIS is Professor of Botany at the University of Wisconsin and a member of the State Board for the Preservation of Scientific Areas. --W. E. Scott

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THE FOUNDING OF PUBLIC EDUCATION IN WISCONSIN
By Lloyd P. Jorgenson

State Historical Society of Wis.
816 State street
Madison, Wisconsin
1956 $4.00

This book spans the period in which Wisconsin cast off the traces of a fur trading society, weathered territorial growing pains and settled down to face the issues of the early years of statehood. From the start, the movement for free schools was essentially local. The main theme of Jorgenson's book is the translation of this widespread public demand into effective public action. --From Wisconsin THEN AND NOW, April 1956. # # #

SEPARATES FROM TRANSACTIONS AVAILABLE FOR SALE

By C. L. Fluke

Orders for separates which are tear-outs from old volumes may be sent directly to the above individual in charge of Reprint Sales at Dept. of Entomology, King Hall, UW, Madison 6. The prices of short papers are 15 cents, but longer papers and articles from volumes in short supply will be somewhat higher. Write for prices of your interests. Remember that separates are available from all volumes except Volume I. First number indicates volume.

Anthropological or Ancient Civilization Articles

W.J.L. NICODEMUS--On the Ancient Civilization of America. 3:56-64
J. D. BUTLER--Copper Tools Found in the State of Wisconsin.3:99-109
EDMUND ANDREWS--Discoveries Illustrating the Literature and Religion of the Mound Builders. 4:126-137
J. M. DeHART--The Antiquities and Platycnemism of the Mound Builders of Wisconsin. 4:188-200
S. D. PEET--Primitive Architecture in America. 5:290-320
P. R. HOY--Who Built the Mounds? 6:84-100
P. R. HOY--Who made the Ancient Copper Implements? 6:101-106
S. D. PEET--Ancient Villages Among Emblematic Mounds. 6:154-176
S. D. PEET--The So-called Elephant Mound in Grant County, and Effigies in the Region Surrounding it. 7:205-220
S. D. PEET--The Clan Centers and Clan Habitat of the Effigy Builders. 8:299-311
C. E. BROWN--Wisconsin's Quartzite Implements. 15(2):656-663
S. D. PEET--The Animal Effigies of Wisconsin and the Totem System. 16(1-4): 320-324.

Arachnida

The following list of papers are primarily on Spiders and the water mites. Two of the numbers come from the scarce volumes, 20 and 29. These two papers are $1.00 each; the others are 15 to 25 cents except the two large papers by the PECKHAMS which are $1.00 each. The entire PECKHAM set can be had for $3.00 and the MARSHALL set for $1.50.

All of the papers on Arachnida are listed below.

G.W. and ELIZABETH G. PECKHAM--Genera of the Family Attidae. 6:255-342
G.W. and E.G. PECKHAM--Attidae of North America. 7:1-104
G.W. and E.G. PECKHAM and WM. H. WHEELER--Spiders of the Sub-family Lyssomanae. 7:221-256
G.W. and E.G. PECKHAM--The Sense of Sight in Spiders with Some Observations on the Color Sense. 10:231-261
G.W. and E.G. PECKHAM--Spiders of the Phidippus Group of the Family Attidae. 13:282-358
RUTH MARSHALL--Ten Species of Arrenuri Belonging to the subgenus Megalurus Thon. 14(1):145-172
G.W. and E.G. PECKHAM--New Species of Attidae from South Africa, with Notes on the Distribution of the Genera found in the Ethiopian Region. 14(1):173-278
RUTH MARSHALL--A New Arrenurus and Notes of Collections made in 1903. 14(2):520-526
G.W. and E.G. PECKHAM--The Attidae of Borneo. 15(2):603-653
G.W. and E.G. PECKHAM--Revision of the Attidae of North America. 16(Pt. 1-No.5):353-646
RUTH MARSHALL--Some New American Water Mites. 17(Pt.2,No.6):1300-1304
CATHERINE E. NEBEL--The Amount of Food Eaten by the Spider, Aranea sericata. 19(1):524-530

RUTH MARSHALL--New American Water Mites of the Genus Neumania. 20:205-213
RUTH MARSHALL--Arrhenuri from Washington and Alaska. 21:213-218
RUTH MARSHALL--Water Mites from China. 23:601-609
RUTH MARSHALL--The Morphology and Developmental Stages of a New Species of Piona. 24:401-404
RUTH MARSHALL--The Water Mites of the Jordan Lake Region. 25:245-253
RUTH MARSHALL--Preliminary List of the Hydracarina of Wisconsin.
I. The Red Mites. 26:311-320
II. " 27:339-357
III. " 28:37-61
IV. " 29:273-297
V. The Red Mites. 30:225-251
VI. " 32:135-165
RUTH MARSHALL--The Water Mite Genus Tyrrellia. 32:383-389
RUTH MARSHALL--Preliminary List of the Hydracina of Wisconsin. Revision of Part I. 36:349-373
PAUL A. KNIPPING, BANNER BILL MORGAN and ROBERT J. DICKE--Notes on the Distribution of Wisconsin Ticks. 40(1):185-197
LORNA R. LEVI and H.W. LEVI--Preliminary List of Harvestmen of Wisconsin with a Key to Genera. 41:163-167.

# # #

PROGRESS NOTE ON EXCHANGES - TRANSACTIONS

CAROL J. BUTTS, Librarian in charge of exchanges, reports that new exchanges formed this year are as follows:

Berlin. Humboldt-Universitat
Erlanger. Universitatsbung
Institute pour la recherche scientifique en Afrique. Belgian Congo
Freiberg. Universitat
India. Geological survey
Pfalzischer verein fur naturkunde und naturschutz
Scottish marine biological assn.
Szeged (Hungary) University
Tokyo. Keio Gijuku University

Referring to the list of exchanges published in the Fall 1955 and Winter 1956 issues of the Review, she believes that "as far as the value of the exchanges received, ...three times the value of the TRANSACTIONS sent would be a conservative figure." Volume 44 was sent to 660 members, 14 special orders, 146 U.S. exchanges and 422 foreign exchanges.

# # #

THE BACK COVER MAP

The back cover map is a reproduction of the frontispiece of TRANSACTIONS of the Wisconsin State Agriculture Society, Vol. VI (1860) accompanying a report to the Governor on "Natural Resources of Wisconsin" by the Executive Committee of which J. W. HOYT was Secretary. The report discusses the distribution of timber in the state in some detail along with this pertinent comment from pages 46-47:

"The Distribution of Timber is a subject of so much interest that we have thought proper to illustrate it in a general way upon the accompanying map. Great efforts have been made to insure correctness of representation, and it is believed that the distribution, as shown thereon, will not be open to the charge of serious error."

In Memoriam -

Edward Martinius Gilbert
1875-1956

EDWARD MARTINIUS GILBERT, UW Emeritus Professor of Botany, died at San Marcos, Texas, on April 23, 1956. He was born at Blair, Wisconsin on September 20, 1875.

After graduation from the Normal School at Stevens Point in 1901, he began his teaching career at Hayward High School, an early connection which gave him a special understanding of education at the secondary school level and proved valuable during the many years he served on the University's Committee on High School Relations. Continuing his own education, he came to Madison and in 1907 received his Ph.B. degree. Appointed instructor in the Botany Department in 1910, he was promoted to assistant professor the next year and in 1914 completed work for the doctorate. Soon afterward he was advanced to an associate professorship, and in 1922 was made Professor of Botany and Plant Pathology, a position which he held until his retirement in 1946. In 1925 he became chairman of the Botany Department, serving in this capacity for nearly twenty years.

Throughout the long period of his devoted service to the Botany Department, he was a constant source of stimulation to many generations of students--not only to graduate students in mycology and plant pathology but to younger students as well. His publications included mycological papers as well as two well-known textbooks of botany in the writing of which he acted as co-author.

Prof. Gilbert was quick to pick up the idea of a junior academy of science for promising high school students--a suggestion which had come out of a national science conference; and largely through his urging and guidance The Wisconsin Junior Academy of Science was founded in 1944, under the joint sponsorship of the University and the Wisconsin Academy of Sciences, Arts and Letters. He was also an enthusiastic worker for the preservation or restoration of natural areas. A rather large share of the credit for the establishment of the Arboretum of the University of Wisconsin should accrue to Prof. Gilbert. He was the first chairman of the Arboretum Committee from the founding in 1932 until his retirement in 1946. During the exceedingly critical period of land acquisition and early development he served as the guiding hand, and his love for the wild country undoubtedly was influential in shaping the unique policy of the Arboretum which included the establishing of a series of native forest and prairie habitats each as complete in representation as possible.

-- Summarized from Memorial Resolution of the UW Faculty.
MEMORIAL COMMITTEE: Ernest F. Bean, Richard I. Evans, George W. Keitt, John W. Thomson, Myron P. Backus, Chairman.

In Memoriam -

Fred Reuel Jones
1884-1956

FRED REUEL JONES, outstanding legume pathologist, died at Madison, Wis. April 5, 1956. He was internationally known for his work on the diseases of forage legumes.

Born near Mercer, Maine on June 9, 1884, he obtained his secondary education at Kent's Hill Seminary. Here he had an unusual opportunity to study Greek, Latin, and other classics with such pleasure and thoroughness that he continued to cultivate them throughout his life. His father's death in 1907 interrupted his formal education when the responsibility of managing the family's 360-acre apple farm fell to him, but he received his B.S. degree in Horticulture from the University of Maine in 1912.

Fred Jones came to Wisconsin early in 1913 to consult with Prof. L. R. Jones, and, recognizing the greatness of the latter as a teacher and naturalist he started his graduate work with him in plant pathology. Here he received the M.S. degree in 1914 and the Ph.D. in 1917. He began his long association with the U.S. Dept. of Agriculture in 1916 when he became a collaborator in what was then the Office of Cotton, Truck, and Forage Crop Diseases Investigations of the Bureau of Plant Industry. He joined the staff of the Department as a full-time employee in 1917 and continued until 1950. Stationed at Madison most of the time, he continued work at the University of Wisconsin until the autumn of 1955.

His interest in the diseases of forage crops began in 1914 when he initiated a study of alfalfa and clover leaf spots. He continued to work with legumes the rest of his life, spending most of his time on alfalfa diseases except for a period following World War I when he gave major attention to diseases of canning peas. Prof. Jones was best known for his researches on bacterial wilt of alfalfa. First observed by him near Monroe in Sept. 1924, he reported it in 1925 and subsequently published at least 11 papers concerning it. Cooperation with plant breeders in the development of varieties of alfalfa resistant to wilt followed and he supplied cultures of the pathogen to researchers in all parts of the world.

He loved the out-of-doors in all of its aspects, was a better than average photographer, interested in music and art, and was particularly fond of good literature. He was a fellow of the American Assn. for the Advancement of Science and a member of many other scientific and scholarly organizations, becoming affiliated with the Academy in 1919. He inspired countless students to a deeper appreciation of the meaning of life and the potentialities which science has in uplifting man and in improving his existence.--Earle W. Hanson

TREASURER'S REPORT

(April 1, 1956)

RECEIPTS

Carried forward from Treasury April 1, 1955:			
Checking account		$2,053.47	
Cash on hand		29.67	
Savings account		750.41	
Uninvested proceeds Life memberships		300.00	
Assets invested in U.S. Savings bonds		400.00*	$ 3,533.55
Receipts from membership:			
Dues from Sustaining, Active, Library		1,791.00	
Patron (R. N. Buckstaff)		75.00	
Life (Henry Tiedeman)		100.00	1,966.00
Contributions to general fund:			
Kimberly-Clark Corp.	$200		
Ruth Marshall (bequest)	100		
C. M. Goethe	100		
Francis Zirrer	$ 2		
W.J.Kohler, Jr.	7		
D.J.Stewart	20		429.00
Junior Academy of Science:			
Sale of pins		23.40	
Miscellaneous		5.86	
Contributions for prizes:			
Murco Foundation, Inc.	$25		
Marathon Battery Co.	25		
Marathon Corp.	50		
Ampco Metal, Inc.	15		
A. W. Schorger	25	140.00	169.26
Receipts from interest on endowment fund			109.75
Receipts from sale of publications:			
Sale of offprints		21.58	
Sale of separates and back issues		147.80	169.38
			$ 6,376.94

DISBURSEMENTS

Cost of Publications:			
Wisconsin Academy Review:			
Vol. 2, No. 2:			
Printing and binding	$268.60		
Typing	25.00		
Postage	25.90	$319.50	
Vol. 2, No. 3:			
Printing and binding	250.95		
Typing	25.00		
Postage	21.77	297.72	
Vol. 2, No. 4:			
Printing and binding	237.35		
Typing	25.00		
Postage	23.36	285.71	
Vol. 3, No. 1:			
Printing and binding	241.80		
Typing	25.00		
Postage	21.18	287.98	1,190.91
TRANSACTIONS, Vol. 44:			
Typing for off-set printing			200.00
Expenses of annual meeting:			
Printing 1000 programs		84.00	
Guests, speaker expenses, etc.		17.50	101.50
Junior Academy of Science:			
Prizes (bonds, magazine subscr.)		123.75	
Expenses of Academy meeting		51.65	
Miscellaneous		10.00	185.40

DISBURSEMENTS - continued

Operating expenses:			
Secretarial allowance, R.J.Dicke	$300.00		
Allowance to Editor of Review, W.E.Scott	200.00		
General postage	78.48		
Stationery and supplies	76.27		
Safety deposit box rental	4.40		
Telephone	8.05		
AAAS Academy Conference	5.00		
Miscellaneous	3.00	675.20	
Total disbursements			$ 2,353.01
Balance on hand, April 1, 1956:			
Checking account	$ 2,353.88		
Reserve for investment in endowment fund (in checking account)	400.00		
Savings account	850.41		
Cash on hand	19.64		
Assets invested in US Savings bonds	400.00*		4,023.93
			$ 6,376.94

ENDOWMENTS AND ASSETS

1.	U. S. Treasury Coupon Bond 1692B	$ 1000
2.	U. S. Savings Bond Registered Series G-M1696059G	1000
3.	U. S. " " " " G-C1563347G	100
4.	U. S. " " " " G-C1563348G	100
5.	U. S. " " Series F-D494206F	500*
6.	U. S. " " " F-M989457F	1000*
7.	U. S. " " " G-C3389339G	100*
8.	U. S. " " " G-C3457898G	100*
9.	U. S. " " " G-C3512841G	100*
10.	U. S. " " " G-C3560656G	100*
11.	U. S. " " " G-C3564110G	100*
12.	U. S. " " " G-C4154481G	100*
13.	U. S. " " " G-C5044011G	100*
14.	U. S. " " " G-C5044012G	100*
15.	U. S. " " " G-C5074307G	100*
16.	U. S. " " " G-C5074308G	100*
17.	U. S. " " " G-C5463975G	100*
18.	25 Shares Mass.Investors Trust ($35.49 per share)	887.25
19.	Uninvested proceeds of Life Membership	400.
	Total Amount of Endowment	$ 6087.25
20.	U. S. Savings Bond Series G-C2386504G	100*
21.	U. S. " " " G-C2386505G	100*
22.	U. S. " " " G-C2386506G	100*
23.	U. S. " " " G-C2386507G	100*
	Current Assets Invested in U. S. Bonds	$ 400

* Value of bond at maturity

/s/ Robert J. Dicke
Robert J. Dicke
Secretary-Treasurer

The Auditing Committee has examined the accounts of the Treasurer and has found them in order. The contents of the safe deposit box and the savings accounts were found in order as reported above for the date April 1, 1956.

Auditing Committee:

/s/ A. W. Schorger
A. W. Schorger, Chm.

/s/ William E. Sieker
W. E. Sieker

Wisconsin Academy of Sciences, Arts and Letters
and the
Wisconsin Junior Academy of Science
Program

Friday, May 4, 1956

ACADEMY SECTION

Robert H. Irrmann, Beloit College. *Milwaukee gives Beloit College its President: Aaron Lucius Chapin,* 1849. (20 min.)

J. G. Winans, University of Wisconsin. *Circular take off and landing by aircraft.* (20 min.)

B. A. Sokoloff, University of Wisconsin. *Printing and journalism in the novels of William Dean Howells.* (20 min.)

G. J. Topetzes and E. S. McDonough, Marquette University. *Fungistatic and insecticidal effects of sodium orthophenylphenate in drosophila food.* (20 min.)

S. J. Peloquin and M. S. Cipar, Marquette University. *Seed and fruit development in Lilium longiflorum var. croft following treatment with naphthalene acetamide.* (12 min.)

James T. McFadden, Wisconsin Conservation Department. *The Lawrence Creek creel census for the 1955 trout season* (10 min.)

Edward Taube, University of Wisconsin. *The name Wisconsin.* (20 min.)

Charlotte M. Cyzak, Marquette University. *Susceptibility of Drosophila melanogaster to attack by certain fungi.* (20 min.)

Preston C. Hammer, University of Wisconsin. *Points of maximum information.* (20 min.)

Ronald L. Giese, Wisconsin State College, Milwaukee. *Further inquiries into the Saratoga spittlebug problem.* (15 min.)

Gerald G. Reed, Wisconsin State College, Oshkosh. *Opinions of science faculties on general education.* (15 min.)

Daniel M. Benjamin, University of Wisconsin. *Hail damage in a Wisconsin red pine plantation.* (15 min.)

John A. Schenk and D. M. Benjamin, University of Wisconsin. *The affects of non-commercial thinning of stagnated pack pine stands on losses attributable to bark beetles.* (20 min.)

Glenn E. Haas, University of Wisconsin. *Ectoparasites of mearns cottontail in Wisconsin.* (20 min.)

Saturday, May 5, 1956

Cyril C. O'brien, Marquette University. *Diagrammatic representations of the learning process.* (20 min.)

Walter W. Engelke, National Audubon Camp in Wisconsin. *Training leadership in nature study and conservation.* (15 min.)

Hjalmar R. Holand, Ephraim, Wisconsin. *A Fourteenth Century exploration in the American Arctic.* (20 min.)

John P. O'Brien and Edward J. Frank, Marquette University. *New evidence that the temperature prevailing in Anoxic skin during x-irradiation is an important dose-effect modifying factor.* (15 min)

Thomas G. Wygant (Introduced by J. C. Perry), Marquette University. *Quantitative studies on the deterioration induced in the male rat reproductive system by delayed injections of estrogen.* (20 min.)

Raymond T. Snyder (Introduced by J. W. Saunders, Jr.), Marquette University. *The effect of thyroxine on melanogenesis in embryonic chick skin cultured in vitro.* (20 min.)

Lyall H. Powers, University of Wisconsin. *Henry James: the crucial significance of The Tragic Muse.* (20 min.)

Nick J. Topetzes, Marquette University. *A selection program for trainees in sales and sales management.* (20 min.)

Frederick I. Tietze, University of Wisconsin Extention, Racine. *The pleasures of science and the pleasures of poetry.* (15 min.)

Ross L. Packard, U. S. Department of Agriculture. *The distribution of the hog-nosed snake Heterodon platyrhinos platyrhinos (Latreille) in Wisconsin.* (Read by title only)

JUNIOR ACADEMY SECTION

Steve Rosolak, St. Regis High School, Eau Claire. *Experimenting with Chick Embryos.*

Gary Kaziukewicz, DePadua High School, Ashland. *Aluminum and Mud.*

David Platz, Aquinas High School, LaCrosse. *Genetics and the Aquarium.*

David Krey, Reedsburg High School, Reedsburg. *A Laboratory Power Supply.*

Franklyn Peterson, John Edwards High School, Port Edwards. *Reaction of Hydrazine and Acrylonitrile.*

Ida Louise Riendl, Columbus High School, Marshfield. *Biochemistry of Cheese Making.*

Tom Corbett, Appleton Senior High School, Appleton. *Hunting Antibiotics.*

Carolyn Ewald, Appleton Senior High School, Appleton. *Protozoan Reactions.*

James Schleis and Larry Schumacher, Lincoln High School, Manitowoc. *The World of Hair.*

Donald Knuth, Milwaukee Lutheran High School, Milwaukee. *The Potrzebie System of Weights and Measures.*

Richard Rappl, Messmer High School, Milwaukee. *Growth of Onion Roots in a Bioelectric Field.*

Ray W. Stubbe, Washington High School, Milwaukee. *The Continuous Cloud Chamber.*

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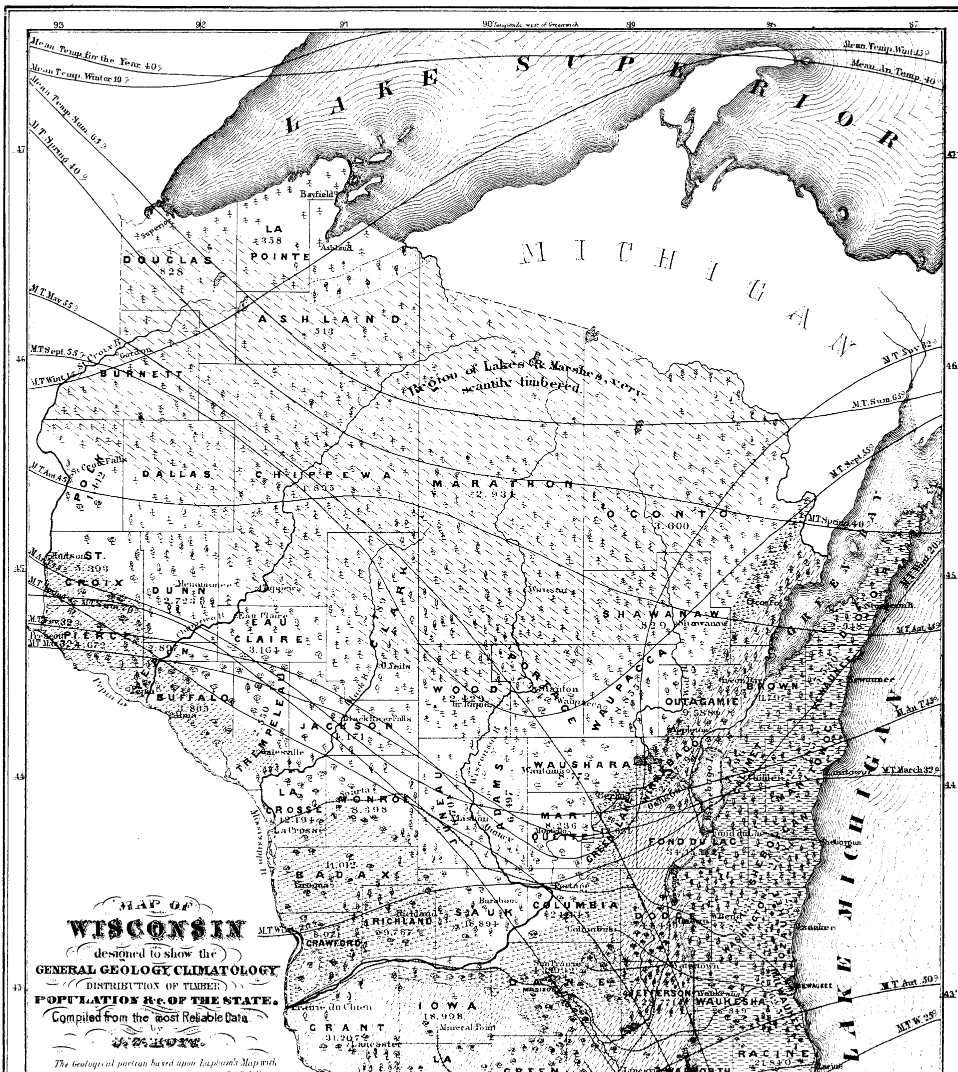
EDITOR, WISCONSIN ACADEMY REVIEW
Walter E. Scott, Madison



EXPLANATIONS.

- *Corniferous Limestone. (and Onondaga Salt Groupe)*
- *Niagara and Clinton Group.*
- *Blue and Green Shales*
- *Trenton Limestone. (Black Riv. Birdsey. and Trenton)*
- *Upper Sandstone.*
- *Calciferous Sandstone. (Lower Magnesian Limestone).*
- *Potsdam Sandstone.*
- *Penokee Iron Range.*
- *Azoic and Plutonic Rocks.*

- *Pine Region*
- *Heavy Hard Wood*
- *Oak Openings*
- *Railroads*
- *Isothermal lines*

Prairies indicated by open spaces in hard timber districts,
Population, by numbers within the several Counties