PRESIDENT'S ADDRESS

PRODUCER, DISTRIBUTOR, CONSUMER

WM. TRELEASE, UNIVERSITY OF ILLINOIS

This meeting marks the tenth anniversary of the organization of the Illinois Academy of Science. Lacking none of the features which have made the earlier meetings interesting and profitable to the members in attendance, and helpful and stimulating to the hospitable citizens of the community in which it is held, it enjoys the peculiar good fortune of counting among its participants a number of distinguished scholars who honor us by their presence as representatives of other and older bodies of men working together in other places for purposes very similar to our own if not identical with them. How they see and are meeting the problems and difficulties of organization for collective effort, we shall hear from their own lips and to our benefit. Perhaps, even, they may tell us directly how we can escape some of the pitfalls that they see us headed for, and that they have had to climb out of themselves.

Concurrently with our meeting, a prominent feature of which is the symposium on public health that Dr. Beard has so successfully planned, there is being held a gathering of physicians representative of several counties of the State. If a double program has been arranged for the two meetings, it is because time was not adequate for making one program better serve the purpose of the meetings as a whole. It was hoped some months ago that at this time an organization might be effected of the collegiate mathematicians of the State, thus bringing to our meeting place active interest in a field of science that is lacking to our programs though its exponents are to be found among our members. That this organization could not be arranged for in connection with this meeting, does not preclude the possibility and hope that our later meetings may be enriched by such an affiliation.

Among the delegates to this meeting are representatives of several activities of the commonwealth lying in our field—sanitation, sewerage, and pure water, inquiry into the biolog-

ical and mineral resources of the State, and the exposition of these in an educational museum which, properly supported and developed, cannot fail to be of great public utility.

At the last meeting of the Academy, Professor Wager brought to our notice the crying need of taking steps—too long neglected—for preserving for our own use and for the use of those who are to follow us, some of the gifts of Nature to a State which is too rich in other endowments to have appraised its prairie and forest, bluff and watercourse, bird and wild flower, at their true value as inalienable from coming generations. A possible national dune park, State reserves, and limited tracts owned or controlled by such organizations as the Chicago Chapter of the Wild Flower Preservation Society, are among the fruits of well directed effort in this direction. Thus far the Academy has been able to give encouragement and approval only: other States have active organizations for the purpose. Is it too much to hope that Illinois will do likewise, and to believe that in conjunction with the Academy of Science a conservation association will work most effectively?

I see in the continuation and enlargement of such affiliations, one of the great possibilities open to us. That less close and general contact among our members may be possible as their numbers at a meeting increase and the program of necessity breaks into sections that meet concurrently, is an evil necessarily attending growth and affiliation: but this is of far less consequence than the good resulting from such organization. The plainest lesson of biology is that success and effectiveness lie in the partition of activity between structurally adequate units; and the aggregation of these into correlated organs and bodies and associations, sharing through specialization the common labor, and unifying it through co-operation.

When the Council made preliminary plans for this meeting, a wish was expressed to disprove any belief that might be shaping itself that a successful meeting is to be looked for only when it is held at the Capital or in one of the university centers. Notwithstanding inherent transportation difficulties, you have justified the belief of your officers that a gathering of this kind may be held with profit wherever the spirit of scholarship exists. The Academy is indebted to the colleges of Galesburg

for this demonstration: and I have no hesitancy in saying that, action and reaction being equal, the debt is being repaid in local helpfulness. The Academy has met already in normal schools; the prediction is safe that in holding future meetings under such auspices, the Academy will further its natural functions, growing in efficiency through every helpful effort. We are invited to hold an early meeting at Joliet. If the invitation is accepted, the meeting can be made one of the best in our history: for Joliet is not only an enterprising industrial city, but one which makes provision for home instruction not only up to the customary school limits, but half way through the college curriculum.

Changing standards of value and their bearing on the various strata of society have received so much discussion of late that we have all become familiar with the fact that a community consists of producers, distributors, and consumers. Every one of us falls into the last-named of these three classes, though he may figure also in either or both of the others and perhaps primarily in one of them. The primitive nomadic and agrarian simplicity of producing everything material that one needed has long since passed except for barbarous peoples or under temporary pioneer conditions, and even then, though life might be sustained on one's own productivity, it has enlisted trade for its amplification. Today consumer and producer are coming to a general agreement that increased cost to the former does not yield generally an inordinate profit to the latter, but that the middle man absorbs the larger part of the difference between cost of production and retail price; and if just in the analysis, they recognize that in the main this is a reasonable reward for bringing into our lives material and intellectual opportunities that nothing but commerce could afford, or for giving us an open market.

A somewhat similar analysis of our educational system shows that, as in commerce, three classes exist—producers, distributors and users of knowledge—we call them discoverers, teachers, and pupils, unless we coin for them more high-sounding names under the impression that we increase their importance or dignity by this. It is within our memory, and some of us have enjoyed personal association with men who passed through the experience, that men have worked literally and in the best sense of the word as amateurs in broadening the field

of scholarship and founding new sciences and new industries now well established as not only valuable, but essential, while making their own subsistence through practicing some vocation or profession already established in the social system. Today the same groping for new things is going on in every one of these newer sciences and industries. Inherited wealth, the production in remunerative quantities of marketable goods or ideas, or leisure for following a predisposition while earning a living, have been the foundation of these advances: they constitute today the support on which most progress rests; but this is being strengthened and broadened by special provision for enabling the exceptional man to use better or to the best, the talent that marks him as exceptional—in originality, intelligent interest and industry.

Through these conditions it has come about that our largest social system, the most essential and best organized after government itself—that of education—has afforded to teachers, indirectly, opportunity for expansion in the field of scholarship and discovery, while invention and the application of discoveries have been promoted directly in proportion to their money-earning worth. Profitable invention and popular authorship are not taught in the schools; in rare cases they may not rest on scholarship as measured by the common standards; but they nevertheless mark exceptional, often unique, talent, and their reward, larger than that of the scholar, is admittedly just and merited.

A body like the Illinois Academy of Science is essentially a body of teachers: teachers in the primary schools, teachers in the secondary schools, teachers in the colleges, teachers in the universities. It is organized to promote stimulating personal intercourse and the interchange of ideas and information; and, in a lesser degree, to give opportunity for bettering methods, avoiding wasteful duplication of effort, and effective co-operation for achievement of the greatest possible collective results. Its membership consists largely—too exclusively, as I feel—of teachers, but every teacher within its geographic field owes it to himself and to every other teacher to be actively interested in such an organization.

As a nation we are coming to feel that national life can be assured only through that most elemental sort of ability that

we call preparedness for self defence, and that this means due participation by every able-bodied man. The great nations that are now at war quickly came to a realization that for them national life depends on adequate industrial organization, and they have effected this. One does not need to lay his ear to the ground to hear the sound of approaching educational organization to the same end, and among these sounds the word "research" is heard very significantly.

Even though we be spared participation in the horrors of the great cataclysm that is rending the world, we shall find it a changed world for the rest of our lives. Everyone is familiar with the expressions "natural selection" and "survival of the fittest," as applied to organic evolution. They are as aptly applied to social evolution; and Bailey's epigram, "the survival of the unlike," points their instant meaning with accentuated emphasis when unlike world conditions are shaping themselves with such rapidity as they are now doing. If the middle-aged teacher of today hopes to grow old in the harness, he must not only see but fall in with the procession. If the young teacher hopes for preferment, he may best look for it through getting well to the forefront, as he can and should if he use the vigor of youth and endurance that is in him.

When we are asked for an elementary teacher in any branch of science, now, we hear the question, "Can he teach agriculture?" A few years ago it was "nature study" that was called for. Vexed by undigested *ologies* and disjointed *isms*, the secondary schools are now trying out "general science." The wants are identical in essence: nature study has been proved, agriculture is having its day of trial, and general science is through the door and may be the favorite panacea tomorrow. Practical, intelligent contact with the world they live in is what we ask for our children. If nature study has been faked, if agriculture be defined too exclusively, if general science prove too vague, a new word will be heard; but it will be merely another effort to secure for the cry a comprehension that the other calls have not brought.

Is it the fault of our children that they do not get what we did not get ourselves, and now ask for them: what they grow up to demand for their children because they were denied it themselves? We see unmistakable signs that the teachers of little

children are addressed in this demand. Do they lack what is wanted? If so, they will assuredly give place to those who have it, in the new shaping of affairs: for to the school we are turning with increasingly intelligent insistance that it shall nourish and stimulate interest, afford adequate discipline for the performance of subsequent tasks, and pass the child on with so large a stock as may be of useful information.

Ability to meet this requirement in the schools is echoed up successively from kindergarten to grammar school, to secondary school, to college, and to university; and the tendency is growing to demand that a teacher in any class shall have benefited from a more advanced field than that in which he is to practice. To the colleges fall the opportunity and duty of building onto the foundation of the school a superstructure of ambition, and of correlation and application of a broadened and deepened knowledge. To me the task of a university seems to be to equip this superstructure with a love of productive scholarship, practice in its methods, and a wisdom that differs in kind as well as in degree from the information and knowledge of school and college. And beyond the university with set requirements for winning its academic approval, lies life: life without set requirement and of unbounded opportunity, or life with its possibilities cramped by need of winning the staff on which it rests.

If doctors or masters go from the university without being capable teachers or public servants or investigators, who is to blame? Some say that the blame lies with these men who come with sufficient preparation for no adequate plan for the life for which they are supposed to be getting the last help that others can give them, and in whom the interest of childhood has never been warmed into the ambition of adolescence. Those who say this, see a remedy in quick and complete elimination of the weaklings, so that their own time, the money of trustful patrons or commonwealths, and the productive power of expert teachers may not be wasted.

If college graduates pass into the secondary schools without fitness for their duty as teachers, who is to blame? Some say that the fault is theirs; some, that it lay in the college which received them with faulty preparation and confined them to narrow and narrowing scholastic paths, or else per-

mitted them to wander to little purpose through the whole field of human knowledge, or even allowed athletic or social ambition to take the place of scholarly aspiration.

If graduates of high schools and normal schools who become teachers in the primary school cannot answer those very simple but very perplexing questions that are characteristic of little children, are they likely to offer to their pupils a choice of secondary or artificial interests better fitted to serve as the web of an education than those they repress? If they themselves do not know the common things of nature, of agriculture, or of world science at large, and so fail to make good, who is to blame? Is it that their teachers in the secondary schools failed because their own teachers in the college failed, because in turn these did not get from the university what it owed them? We are disposed to pass the blame along or to lay it on faulty materials out of which even a good workman cannot make anything capable of standing inspection. Do we bring it to rest somewhere on ourselves? If so, the remedy ought to be applied right there. Do we distribute it equally or partially? If so, the average ought to be raised by removing the weakness.

Teachers cannot place the trouble indefinitely with the human materials that go through the workshop. Men and women are not born into the world equal in talent, physical vigor and environment. We are coming to recognize the obligation of society to make the best possible out of every human stick, and we may be going even beyond the dictates of wisdom in what we do for the deformed and the defective. If a child is incapable of marching with the other children, we put him into a grade or a school where his gait is that of the others instead of holding back a normal class, or dragging him hopelessly along at its pace.

There are some who contend, and with emphasis, that if a student is not able or willing to sustain a rather high grade of scholarly progress in college, he should not be permitted to direct public or private benefaction to himself from some one more capable or more worthy. And not a few people think that the benefits of university student life should be restricted to those who demonstrate from the start or by very marked improvement, that these are being assimilated. A more careful

sifting of materials and selection of workmen is coming with the changing conditions. If I read the signs correctly, this selection is going to eliminate from the work shop those who are not good teachers: but it is going to pass the straight and the crooked sticks through different shops instead of casting some aside.

What are the ideals sought in a teacher? They appear to be an undying interest followed by ambition and culminating in a good workman's love of his handiwork, in some field of knowledge, reinforced by adequate knowledge and wisdom and equipped with scholarly habits and a capacity to share with others what he has and in such a way as to vivify in them his own interest, knowledge, and productive talent, without himself losing in either.

So far as I know, there is only one way of achieving this—intimate personal contact with the truth; and that is all but synonymous with sustained contact with the scholarly progress of the world and with the underlying materials of such progress. Does a man go into teaching without realizing this? In my judgment he mistakes his vocation. Does he enter the profession unequipped for it? If so he faces predestined failure. Does he think to lead a care-free life of respectable indolence? He should remember that his opportunity is desired by equally able men of higher ideals.

In school and college few men, and they the exceptionally constituted, find time or opportunity for scholarly production beyond their grade; but if they see this door closed to them, it is because they have not lifted the latch rather than that nothing original has been left for them to do with limited opportunity. The university nevertheless is the real workshop of our day and generation: it has found means of lightening the burden of service so that time and energy remain for research beyond the set task of teaching, and it offers appliances and materials adequate to such work of the more advanced kind. By a process of natural selection misfit investigators who cannot or will not teach and teachers who cannot or will not produce are eliminating themselves from its dual chairs.

When I accepted a call to the University of Illinois, something less than four years ago, I found reason to congratulate

myself that I was entering an institution which generally pays its younger men a fair salary for twenty hours' service a week —half the daylight time, exclusive of Saturdays and Sundays —leaving them free to carry half the normal amount of graduate study if they wish to work for a higher degree: which eases up on the amount of class room service after they have earned the Doctor's degree and passed into higher grades of appointment; and which makes due allowance for the petty but engrossing duties of department administration.

To me, this was an indication that the great establishment of which Illinois has so much reason to be proud, has passed from the stage in which justification of expenditure has to be made on the basis of either clock-time or semester-student-hours spent in teaching, and that beyond this essentially half of one's time through the college year, and a bonus of a quarter of the year in form of an entirely free vacation, is placed at his disposal for delving into the specialty that represents to him the fascinating part of life—with due provision also for necessary recreation and desirable public service.

It has never seemed possible to me that a university man who sells his service as a teacher may be tempted to defraud the purchaser by trifling with his duty or evading its performance; or that any such man can bend himself to see any justification of such an act when freedom to do what he most wants to do is so liberally granted. The privilege of entering into the lives of a body of young people such as one finds on the campus has seemed to me in itself a sufficient reward for the time and effort needed to do the best in one's power for them in the class periods that the limited schedule makes possible: and the financial end of the contract has seemed to me a means of making possible the scholarly use of what is left free of the day and the week and the year.

So far, I have found very few people who are so misguided as to look to teaching as the means of acquiring fortune, or who are so self-complacent as to take the leisure it accords as a merited tribute to eminent scholarship: on the contrary, they realize that they have acquired eminence, if it be theirs, through scholarship, and they sustain both, if at all, through a directed industry that constitutes the chief pleasure of life for them.

It is really a misfortune that in the great universities only advanced and specialized students come into close relations with their most eminent teachers, and this is not infrequently a cause of complaint. I wonder if it has occurred to those who would claim the personal attention of a university's eminent scholars in the elementary class room that disillusionment would follow as soon as the stopping of intellectual growth had put the idols' scholarship in the past tense? I wonder if it has occurred to those who, as a general principle, would accept full time teaching by the clock—even effective teaching—as a university professor's duty, that every man who is satisfied to repeat without amplifying, eats bread that is craved by some other man as a necessity for acquisition of the knowledge that he himself retails? That is what it comes to.

I am presenting the point of view of a teacher. If I had to view the matter as an executive, I am not sure that I should not recognize that now and then a university teacher is successful beyond his colleagues in stimulating interest and enthusiasm in something worth while but in which his own productivity is nil. If so, I should recognize his worth; but if he enjoyed the privilege of a moderate teaching schedule and great unused opportunities for research, I might ask to be shown that he really stimulated an interest and enthusiasm that seemed foreign to the impulse of his own nature.

I know of no means so well suited as an organization like our own to bringing teachers and investigators together for mutual helpfulness. I know of no comparable opportunity for humanizing and vitalizing abstract discovery side by side with exhibition of the obscure little things that some few have eyes to see and through the seeing of which, once understanding how to look, every one of us may establish and maintain that touch with nature which is the mainspring of successful teaching in science, and which is also the germ of research —out of which, with favoring environment, productive scholarship grows in larger units. In our field, the successful middle man of necessity is also consumer and producer. This Academy is a market in which he may at once buy, sell, and negotiate, and at the same time learn.

The touchstone of success is efficiency. The measure of efficiency lies in achievement. Achievement nowadays rests on division of labor and specialization. Successful teachers are known by the successful specialists they train and through the additions they make to knowledge. Because these additions are published, publication becomes something of an index to one's productivity, qualitatively as well as quantitatively. It constitutes a sort of Who's Who in Activity, valuable as far as it goes, and characterizing the unsuccessful quite as well as the successful man; but its indications, as the years run on, are seen to be sometimes read through the fads and the tendencies of the day, and they may not always carry their face value. Nevertheless publication gives the most available data for judging productivity, and the day of oral transmission of knowledge has so far passed that it now constitutes the principal means of such transmission. Publication of the detailed results of investigation, of the human interest phases of such results, and of popularly comprehensible introductions to the sciences has become a duty of everyone who has that which may be shared with others through this channel.

What is true of the individual is true of the organization. To do its work effectively, our Academy must stimulate investigation through its meetings; and it must make public its acquisitions. It is greatly to your credit that this fact, recognized clearly from the first, has been applied in the issuance of annual volumes that contain much of interest to the general public and stimulating to the teacher, and much that future investigators must reckon on in their work. This has been done under great difficulties, and money has not been found for making publication either as full or as prompt as the merit of the Academy's papers demand. The prospect is now most hopeful that the commonwealth will meet a request for funds that will enable your officers to publish promptly and fully— if in modest form— what you contribute to science and its popularization through these meetings, and to distribute your Transactions broadcast through the State so that every investigator and every teacher may make free use of them. It is our solemn obligation to see that through publicity we make a record, collectively and individually, in which we and the State may take pride.