

PRESIDENTIAL ADDRESS

IMPRESSIONS, INVESTIGATION, INVOLVEMENT¹

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In the days of our grandparents, the three R's formed the hard-core basis for youthful education. A foundation of Reading, 'Riting and 'Rithmetic established a reliable base from which educational maturity ensued. Although we have an accelerated rate of learning with our present-day progressive schemata, the course of our nation's educational trip has changed only in its sophistication. Currently, people of all ages respond to society with the three I's: impressions, investigation and involvement. To the scientist, this is a familiar pattern. Paraphrasing the three I's, the research scientist investigator identifies with area of concern, experimentation and publication; his research reports are organized with introductory background, observations and interpretations. The teacher-student relationship, at all levels, identifies with learning, testing and application. Let us consider the what, where, who and why of the three I's.

Impressions

Impressions, as with beauty, are in the eyes of the beholder. Consider impressions in the first two-thirds of the twentieth century—and that should involve all of us who are here this morning. From the standpoint of the biologist, the rediscovery of Mendel's pioneering research, the acceptance of evolutionary evidence, the economy of production in agricultural products, the biochemical understanding of hereditary units, the universal dependency on drug usage, and the realized potential control of our unyielding population explosion have topically impressed mankind.

From the standpoint of the physical and technological sciences we have viewed unbelievable advances in the areas of transportation and communication. There are vehicles for traveling on greatly improved highway networks (autobahns, interstates, autostrades, etc.), vehicles for exploring the depths of the oceans, vehicles for quickly circling the globe or for foreign travel, vehicles for piercing the universe. Communication has advanced with the reflection of TV beams from the orbiting satellite. We are promised visual telephone connections for the near future and automation has replaced thousands of people, as recently demonstrated with the telephone strike. And the atom has been harnessed.

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Our social sciences have viewed, nay are viewing, a social upheaval which is reminiscent of a century ago. Consider these: World War I, to end all wars, World War II, truly a global war, plus wars in Korea and Viet Nam; the civil strifes—in Africa and other colonized nations, as of Great Britain; changes in fashions—short skirts, long skirts, extremes in both directions—long hair, short hair for men, women, boys, girls, each trying to be original or to conform—or to conform or to be original; the enigma of “Is it a he or a she?” Musical tastes have swung like the pendulum, as have other parts of our culture—such as the dance and art.

These are not random thoughts. These thoughts reflect an era. Impressions! Unless we pause to reflect, we are apt to very rapidly accept as the expected, that which formerly was so outstandingly impressionable. I trust that we will never cease to be impressed. For if we are not impressionable, we are dead—we are inert.

Investigation

Perhaps our most significant function is not that we are impressed, but that we respond. Sequentially, we investigate the what, the how and the why.

In some way, be it large or small, we have all “investigated” a portion of the events with which we have been impressed. Many of us are in the teaching profession and are constantly investigating. Investigating new knowledge in our disciplines, investigating new teaching techniques, investigating the student’s retention, and investigating the effectiveness of our teaching. Research people are continuously investigating new hypotheses, techniques, interactions and correlated responses. With the egoism that is man’s, we continually seek (investigate) problems which relate to human welfare—both social and medical.

In a somewhat different way, today’s “hippies” are investigating. Is their search for truth an unbiased search or is it a rebellion against the veneer of today’s society? Is their search for love a heartfelt, sincere desire, or is it an anti-war, an anti-hate revolt? Is their heterosexual freedom the real us in an uninhibited environment, or is it merely an expression of non-conformity, or is it a religious rebellion? Is their desire to become “high” on drugs really bad, or do they just want to leave the worldly harassment and visit fantasy? Within the last week, a Brookings senior high school student who has achieved to a very high degree expressed in a letter to the editor his disgust with recent U. S. events. This was a bold step for a 17-year-old. Despite the apparent abandonment of this “mod” group, one must recognize that they are, in their own unique way, investigating. Or are they escaping, so that they will not have to investigate?

Investigation is not always on a voluntary basis. In a real sense,

I was one of hundreds of thousands who investigated the conflict during World War II. The negroes, particularly of our generation, have been impressed with their social stratum and are investigating in a very real way. Scientists, many of you who are here today, are investigating in highly specialized areas. Investigation is a must for the intellect.

Involvement

And now involvement, considered by many to be the culmination of life’s worthiness. It is an ill-advised person who becomes involved after merely being impressed and does not investigate. What is it that the old adage recommends, “Look before you leap?” Probably the easiest thing for most of us to do is to read the newspaper, or to follow the textbook or to read research reports—and be impressed. Amen. With proper motivation, we may decide to investigate further by actively participating in community, national and international events which help to shape our environments, or by exploring the hows and whys of the subject matter, or by conducting original research. But the real you is the you who becomes involved. In a sense, I feel like a preacher on Sunday morning telling his parishioners that more people should come to church. Certainly, you folks are involved in our Academy meeting. It takes some effort for each of you to come to our meetings, and I certainly trust that the involvement which you enjoy here is rewarding. As a gesture of appreciation (and involvement if you will) I took it upon myself to send an original copy of the following letter to each of your college and university presidents.

On Friday and Saturday of this week, our South Dakota Academy of Science will assemble at Huron College. We do appreciate participation by staff members from the colleges and universities in South Dakota. This annual meeting, which is held at different campuses on a rotational basis, is the most unifying assemblage for staff scientists in South Dakota.

We solicit your encouragement of staff member participation from your institution. I hope that you will also send some students to the collegiate section of our annual meeting.

Please feel personally invited to attend, participate and become involved in our meeting if you should so desire.

For some members of our society an aberrant pattern may evolve with the three I’s. There are those who may be impressed, but decide that they lack interest or competence to pursue the matter. We all experience this to some extent. I am impressed by the potential of the laser beam, but I have no immediate interest in investigating or becoming involved in a study of the production of or capability of the beam.

Another sector of our society becomes impressed by a situation and investigates further, perhaps by reading any available pertinent accounts. However, the safe position may be one of non-involvement. There is no gamble, when one observes from the sideline.

A meaningful parallelism might be a consideration of the investigator who is challenged by a problem and explores the problem in depth, but he just doesn't become involved in culminating the research with a scholarly written report. He never publishes. Or a teacher may discharge information to students and adequately test the students. But if the students are not stimulated or challenged to apply (involve) their newly acquired knowledge and they do not relate this knowledge to their lives, the teacher has stopped one short of attaining the three I's. A common measure of a teacher's ability is the success of his students in their later-day involvement.

The following account appeared in a letter from the American Hospital Supply Corporation. There is a message here for all of us.

Newton had his apple, Galvani his frogs and Watt his tea kettle. Throughout history great discoverers and inventors have been aided in their efforts by often unexpected means.

In the case of the great microbiologist, Robert Koch, it was a boiled potato. The cautious Koch never threw anything away without first subjecting it to intense scrutiny, so when he found half of a boiled potato left in his laboratory one day, he followed his usual routine. Noting a collection of small colored droplets on its flat surface, he examined them further under the microscope and found that each droplet contained thousands of identical organisms, with every droplet a pure culture of a specific microbe. From this, the method of isolating a specific germ by growing it on solid culture media evolved.

Pasteur found his means to a great discovery in an old culture containing chicken cholera bacteria which he had prepared prior to taking a much needed vacation. On his return several weeks later, he inadvertently used this culture in his inoculation studies with chickens. Much to his surprise, the chickens did not become ill then nor after repeated injections. Pasteur tried fresh culture and still they resisted the effects. He injected a new lot of chickens and they soon contracted cholera. Artificial immunity was now within reach. Pasteur summed up such accidental discoveries with his famous observation, "chance favors the prepared mind."

These men were impressed, they investigated and they became involved.

Earlier it was suggested that the members of our society who do not engage the three I's sequentially may fall into an aberrant pattern. One is challenged to ask then, which of the aforementioned is the normal and which is the aberrant?

Certainly we must become involved! How do we become involved? I speak now of and to the Academy. Your executive council has outlined three very positive steps by which we may become involved in the improvement of the Academy. One method is to observe deadlines—next year the final date for accepting submitted abstracts will be more than a mythical date. Another method is by appointing assistant editors who will more completely review your papers when they are submitted to be considered for publication. The third method involves notifying our state executive leaders that the South Dakota Academy of Science is available for consultation and that the expansive membership of this group is the most representative state-wide science group in the state of South Dakota. This will be done.

Ultimate Universal Understanding

I wrestled with a theme which was meaningful to me and one which would be apropos to the academy. The following themes were considered:

"VISION, MISSION, TELEVISION"

"DECCELERATION: Of the war, Of science support, Of science interest, Of political candidates"

"SENSITIVITY, SCIENCE AND SECURITY"

"CHANGES IN EMPHASIS" and "YOUTH ACCELERATION"

Probably for the city of Huron, I should have concerned the discussion with the three H's—particularly with a Humphrey drugstore in business here. It seemed timely to focus our eyes upon the I's—Impressions, Investigation, and Involvement. As a finale though, let us turn to the three U's; Ultimate Universal Understanding.

We keep hearing that "These are changing times." I've heard it all of my life. And it has been true. Some of us are wary of a static condition. Some fear overt militarism; others fear unpreparedness. At least, we are impressed. Investigations of our society, as with our research problems and our student classes, require access to and analysis of pertinent information. When we have made our decisions, we must take a firm stand of commitment and let us become involved in our society! Let us pledge ourselves to teach as we believe and to seek so we may learn through impressions, investigation and involvement toward the goal of ultimate universal understanding.