PERSPECTIVES ON TOMORROW
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The Fourth Annual University Convocation-Alumni Homecoming—October 1963

Traditional social events and the Rochester-Allegheny Homecoming game shared the Weekend spotlight with Convocation lectures and seminars.

Some sobering sidelights on the future came from Harrison F. Dunning, president of Scott Paper Company, in his talk, "Tomorrow May Be Too Late," at the College of Business Administration's fall assembly, which opened the three-day program.

Some 53 alumni, as special guests of the University, learned about recent developments on the three campuses from faculty, students, and top administrators during the annual Alumni Symposium preceding the all-alumni weekend events.

The College of Engineering and Applied Science dedicated its new Hopeman Engineering Building, for which funds were contributed through a bequest from the estate of the late Bertram C. Hopeman, and a gift from the late Albert A. Hopeman Sr. and Mrs. Hopeman. Left to right: Albert A. Hopeman, Jr., Arendt Hopeman, Dean John W. Graham, Jr., President W. Allen Wallis, the Reverend Dr. Carlton C. Allen of Twelve Corners Presbyterian Church, who gave the invocation, and Joseph C. Wilson, '31, chairman of the University's board of trustees.
TOMORROW

THE SOCIAL IMPACT OF TECHNOLOGICAL CHANGE

James R. Killian, Jr.

Principal speaker at the All-University Convention, Dr. Killian is Chairman of the Corporation of Massachusetts Institute of Technology and former M.I.T. President. He heads President Kennedy's Foreign Intelligence Advisory Board and from 1957-59 served as President Eisenhower's Special Assistant for Science and Technology.

When I was in Washington and peripherally involved in the advancement of our weapons technology, I saw examples of where soundly conceived new weapon systems became obsolete before their development and manufacture could be completed. Novel and sound when they were started, these systems were overtaken by changes in technology, and given that Pentagon epitaph "OBE"—overtaken by events. Ideas in many other domains suffer from this threat of obsolescence, and so do brash new speeches.

In discussing with you some of the actions we should take today in order to make the most of the future, I will try not to din into your ears too much of the overworked data, spectacular as it is, on the effects of science and technology on our lives and our society. You are fully aware that among the currents flowing through our times which affect us most profoundly today are the exponential growth of knowledge, notably in the sciences but also in many other fields; the enormous increase in useful energy; the "eclipse of distance" and nearly instantaneous communication of events the world over; and the consequent global quality of the human community, in which all people are involved together, and their aspirations mutually stimulated and amplified.

Familiar as they are, these are the transcending coefficients of the world in which we dwell, and the fact that they are becoming the grand clichés of our time does not diminish our need to understand them and to reflect on where they may lead us.

Tradition has it that Adam, when the angel arrived to drive them from the Garden of Eden, remarked to Eve, "You must realize, my dear, that we live in a time of transition." If that was a cliché even then, it nevertheless pointed up a poignant fact full of implications for mankind.

Actually the rapid growth of scientific knowledge is not a recent development. As Robert Oppenheimer has pointed out, "for over two hundred years there has been a constant growth in the number of people working on scientific problems and in the number of works they have made and published about our knowledge of nature, of ourselves as a part of nature, and of the application of science in technology. Indeed the scientific revolution has white hair; but it still has young eyes."

What is new is that we have become acutely aware that this accumulating knowledge is rapidly creating a new world on a new scale, a change of state, challenging our powers of adaptation and our capacity to master it for human ends. How can our society navigate the onrush of knowledge benignly to work?

How can our society navigate the onrush of knowledge benignly to work? How can we, in the deepest sense, become a purposefully adaptive society, exulting in the process of change and invigorated by the opportunity to put an ever-growing torrent of knowledge benignly to work?

There are those who are timid and frightened by this affluence of knowledge, but I cannot imagine their fears so prevailing that our society, out of a loss of nerve, tries to curtail its power to create and accumulate the products of the mind. Is this confidence naive? Are we likely ever to come to the point of wanting to plow under every other intellectual row? In quite another context, the astronaut, Colonel Glenn, gave the telling answer. When certain people said to him that it was contrary to God's wishes to explore space, his response was, "The God I believe in is a bigger God than that!" A fragment of light verse by Sir Frederick Gowland Hopkins states it another way:

I often wonder as I go
What makes the little daisies grow,
And when I die as die I must
And dust again returns to dust
Some other fool will want to know
What makes the little daisies grow.

It is against the background of this personal optimism about the pageant of newness of which we are a part, that I now drop to a workaday level of discourse and examine three categories of practical requirements we must meet if we are to stay on top of the growing abundance of knowledge and bend the process of change in our benefit.

I speak first of the need for us to achieve a change in attitude toward the utilization of our human resources, especially our highly skilled professional talent. In the Federal Government, we go to great pains and debate to budget our dollars, but, so far, we have paid only modest attention to the budgeting of manpower. We sometimes embark upon a great new undertaking without counting the cost in talent, especially that kind of talent which Walt W. Rostow has termed "break-through scientists." As a result, the new undertaking suffers from inadequate competence, or else it takes away from...
other sectors of our national life the talent that they need. There are, of course, enough “bodies” to go around, but this is far from saying there is enough creative talent. One gifted man will frequently solve a problem when ten or even a hundred second-raters will fail. What is needed is an awareness by decision-makers in both our private and public sectors that the human resources cost must be weighed and that every effort should be made to utilize these resources efficiently and, with all our national goals in mind, to upgrade and update the skilled personnel we have. I can report encouragingly that both in industry and in government this problem of deployment of talent is receiving careful attention.

If anyone doubts that manpower shortages have been building, he should get the facts about the declining percentage of new college faculty members with Ph.D.’s. In the four-year period 1954-58 the net increase in faculty members was 95,000 while the total Ph.D.’s awarded was 38,900, many of whom did not go into teaching. If this is not convincing, he should consult with the president of almost any liberal arts college about the basic need to make a dent in the short-age. The schools and colleges of the country have a steadily growing obligation to offer educational opportunities to people who have embarked upon their careers. Post-doctoral, post-degree, or advanced study will increasingly become a feature of our universities. This advanced study is well established already in the military services, in management, and in schools of education, and it is now beginning in engineering. Many of our universities are becoming tripartite, with an undergraduate school, a graduate school, and a post-graduate school enrolling mature professional people on leave from their normal positions. This is going to be one of the major adjustments we must make to keep on top of the rapid growth in knowledge and use it for our social benefit.

I come next to the impending crucial reappraisal of our scientific research and development program in the United States, especially that part of it financed by the Federal Government. After a long period of rapid growth, it is appropriate that careful study be given to whether the current rate of growth is right.

This year the Federal Government is spending nearly fifteen billion dollars for research and development, thus supporting more than two-thirds of all the “R and D” in the nation, and directly or indirectly paying the salaries of nearly two-thirds of all scientists and engineers working in R and D. This expenditure has been increasing faster than the gross national product, or the total Federal budget, or the supply of scientists and engineers. The major part of the expenditure is necessarily related to defense and therefore to development.

My own judgment is that the current level of expenditure, public and private, is not too large, given the urgent needs of defense, that there are multiplying opportunities for fertile new research, and that the program is yielding immense dividends for the nation. However, there are many ways in which we can improve the deployment of our R and D resources. The proportion of effort and dollars going into basic research is still too low, and there is a tendency for the currently stylish or glamorous fields—“Big Science” involving big equipment, for example—to get support at the expense of “little science,” the less spectacular and quieter domains of research. There is also evidence of a leveling off of the private funds which industry is investing in research.

An undercurrent of concern in Congress about the size, objectives, and results of our vast Federal R and D program has found expression in a unanimous vote of the House establishing a select committee to study and investigate all aspects of Federal research and development. If conducted with wisdom and with appreciation of the subtle values involved in research and of the manner in which research supports our national goals, as I believe they can be, these investigations can do much to achieve a better public understanding of the role of science and technology in our society, and they can provide data helpful in making wise decisions about priorities, emphases, and balance. Anything short of a statesmanlike exploration could do damage at a time when American science is enormously vital and creative and when we are experiencing, in Warren Weaver’s phrase, a “great age for science.”

In all this, we must bear in mind also that the Federal Government’s support for science and technology in general and for basic research in particular has had a major impact on higher education in this country. Thus, in evaluating the size and distribution of our over-all expenditures for research and development, we must remain conscious of the relationship of these funds to the education and training of our future scientists and engineers and not view the problem solely as one of current allocation of resources. It seems to me, therefore, that we should be especially cautious as we review the basic research and education support provided by the Federal Government, and in particular that provided by the National Science Foundation. Our future strength in science and technology is in large measure dependent on measures we take now, measures which unfortunately often appear to be the easiest to postpone. The programs, new and old, of the Science Foundation, have been formulated largely with the future in mind and must be spared the fate of hasty or arbitrary reductions in appropriations that stem primarily from current concerns.

It is obvious that the skill with which Congress deals with its legislative responsibilities with respect to science and technology can profoundly affect not only the future strength of scientific and engineering professions in America, but also other domains of learning, including the social sciences and the humanities and, indeed, all higher education. The relationship between science and government is the anvil on which government relations with a wide range of creative and learned activities can be shaped.

These investigations and appraisals also call for poise, objectivity, and statesmanship on the part of scientists. At a time when the role of the expert in government and of science advisers is under scrutiny, there is a superb opportunity to illustrate how professional men can serve the nation by being professional in the highest sense of that word and by putting national above parochial interests.

My third category of urgent requirements involves the widening role of the university and its faculty in our national life. Of its growing responsibilities I select two.

The first is the need to reform and refresh the obsolete curricula of our schools, including many programs in our four-year colleges. This need has become acute not only because rapidly growing enrollments have resulted in a severe shortage of competent teachers, adequately trained in the subjects they teach. It has become acute because of the rapid growth in knowledge and the consequent difficulty of clearing the way to an essential manageable core for teaching. Obsolescence
has steadily spread because there has not been an adequate collaboration between the scholar and the teacher; there needs to be a steady input into our classrooms at all levels of the new insights our creative scholars obtain at the far frontiers of their subjects. The investigators working at the cutting edge of their disciplines can contribute to the excellence and integrity of the substance presented in even the most elementary teaching of their subject. In addition, the masters of a discipline, as Martin Mayer has written, find an unexpected fascination "when they seriously undertake the intellectual exercise of looking at their field afresh, through the eyes of the beginner." Clearly this demand for a closer collaboration between the scholar and the teacher brings the university once again into a fruitful relationship with the schools.

As Philip Morrison, Professor of Physics at Cornell, has remarked, "Only when the universities recognize that all learning is partly their business can a self-sustaining educational system not cursed by intrinsic obsolescence come into being."

We are far from having achieved this system, but there have been encouraging developments in the past half-dozen years. Through the initiative of scientists and mathematicians centered at the start in a few universities, we have had demonstrations that master scholars, working in close rapport with skilled teachers, can achieve curriculum reform with impressive classroom results—reform that brings into the classroom a new degree of relevance, up-to-dateness, and integrity. Such new courses as the high school physics program developed by the Physical Sciences Study Committee are now spreading with surprising speed into our secondary schools and are setting new intellectual standards on a very large scale. This movement marks a reawakening to the fact that children have a native eagerness to learn that is frequently stifled. Their inherent interest in the world about them responds wonderfully when it is adequately nurtured and encouraged and neither blunted nor put off until later. It would appear that these new programs can bring to the teaching of the sciences a new authenticity and delight. They may so deepen and advance our science education that students can achieve a much higher level of intellectual maturity than is now usually possible within the normal span of education.

The spectacular success of these new courses in science and mathematics has now inspired university scholars in other disciplines, notably the social sciences, as we build new ones, and as we see a steady and highly desirable expansion of their services, let us keep steadily in view that our universities must first and foremost be places of "light, of liberty, and of learning."

Let me point up this responsibility by describing the growing impact of our major universities on the economic health of their areas, and the implications of this to the pattern of economic development of the nation.

The evidence seems overwhelmingly clear that strong, vigorous universities are becoming nuclei around which new industrial growth tends to coalesce. Much of the research in our universities, in science and in engineering is a seed bed for new processes and new products important to industry. Industry wishes to be fully and quickly informed about these new developments. It values the flow of new ideas and new discoveries from our university laboratories and appears increasingly to feel that propinquity facilitates this flow.

Vigorously growing industries must also have steady inputs of new talents nurtured in this seed bed and educated to work in and to master the rapidly emerging new technologies. Strong universities, through both their undergraduate and graduate schools, draw, educate, and make this kind of talent available. Especially is this true of our great graduate schools embracing science, engineering and management.

More and more, industry seeks out outstanding scholars in science, engineering and management as well as the men and women they educate. It relies upon the kind of competence that clusters on the frontiers of knowledge. Strong universities attract this exceptional competence and provide it with a stimulating environment in which to work, one that encourages and rewards disinterested curiosity and creative achievement.
Not only does new industry tend to gravitate toward strong university centers; so do the growing number of establishments primarily engaged in research sponsored by the Federal Government, and for much the same reasons. With few exceptions, they flourish best when they can take advantage of close proximity to the creative vigor and resources of talent provided in a university community.

The university has an invigorating intellectual climate resulting from the lively interaction of questing young minds, fresh and eager in outlook, with older minds full of wisdom and learning. This climate extends beyond the gates of the university, lending vigor to the neighboring areas and institutions.

At some point in the growth of a vital scientific and technical community, it "goes critical" and begins to generate its own energy of momentum. In other words, it becomes large enough and varied enough to interact within itself in a way highly stimulating to its members and highly attractive to others of similar professional talent. As President Kerr of the University of California has said; "Good scholars tend to swarm together." A good university, or perhaps more than one, is usually the core of such a community, but it usually includes a "reactive blanket" of research establishments. And together, if and institutions.

The heavens declare the glory of God and its idealistic aims. The universities which have generated new economic resources for their communities have done so primarily because they are strong centers of scholarship, teaching, and research. The economic advantages they provide are generally by-products of their success in advancing learning. Their economic impact comes not from any narrow utilitarianism but from their intellectual breadth and depth and their idealistic aims. The greatest contribution a university can make to its community and to the economic strength of the nation is to be a great university. Given that kind of academic strength and intellectual vigor, it is certain to make important contributions to our economic and social progress.

I come finally to a requirement for our society, and its intellectual and spiritual poise, that I mention almost with embarrassment. This is the need to mitigate what appears to be a renewal of the conflict between science and the humanities. What we witness today can best be described as a cold war with baring of teeth on both sides but no large-scale engagement. It all seems silly, an aspect of the vested interests and the snobberies which sometimes appear among learned men. This kind of antagonism in the end is damaging to both sides.

In my view, Sir Charles Snow did a disservice to science in reopening the old antagonisms and in extolling the intellectual gifts of the scientists in a way smacking of scientific chauvinism. By the same token the prestige of the humanities was hurt by some of the savage attacks on Snow, both in England and the United States.

While the humanities seem to be in robust condition, the nation should miss no bets in mobilizing the resources they need to flourish. The social sciences are steadily gaining in power and scope, and we are currently witnessing impressive progress in the behavioral sciences. Frank Stanton recently quoted a wry quip that the social scientist is one who is stuck somewhere between Plato and sanitary engineering. Like most wisecracks this missed the mark when it was new, and it is far from the target today, but it does spotlight the need so widely felt that a great creative thrust in the social sciences is essential if we are to use our growing knowledge and power wisely.

Perhaps a study for the humanities and social sciences similar to the powerful report, "Science: the Endless Frontier," which Vannevar Bush and a panel prepared at the end of the war, might lead, as did that report for the sciences, to action on a wide front, including the establishment of new institutions for the advancement of the humanities and social sciences. We need bold and creative proposals to give these noble disciplines equivalent opportunities. What we do not need is an effort to strengthen these fields by curtailing science. Let us take advantage of the enormous vigor in our universities today to exploit to the fullest all of man's intellectual and creative abilities, with each aiding and abetting the other.

In conclusion let me suggest just one of the many aspects of science which today illustrates its neighborly relationship with the humanities and places before them a sobering challenge. I speak of the flowering of Darwinian evolution into a majestic concept embracing the total sweep of life, beginning with the elementary particles of matter and moving onward to the origins and replication of life itself. Inherent in this advance of science, steadily illuminating the grand design of nature, is evidence of a progression, and a suggestion of the startling possibility that man may some day acquire the power to expedite and direct this upward thrust of the human race.

This modern concept of evolution is but one pillar of the towering edifice of scientific knowledge. There is something poetically beautiful and exalting about this great cathedral of thought as its structure grows. We stand before it with a sense both of the great reach of man's mind and of its great unrealized potential. It gives us a heightened concept of the inner meaning of the psalmist's words: "The heavens declare the glory of God and the firmament shoveth his handwork.

In considering the meaning of science for man, perhaps this poetic sense of the fantastic range and growth of man's knowledge may be, in the end, one of the most enriching gifts science brings to man, charging his life with ever new and ennobling values.
I am certain that history is not just an airy invention of the mind, a mere creature of man's desire, a documented fragment of the imagination, a sophisticated "factualized fiction." But I do not know of any precise science of history. Nor do I know of any rules with which to deal with human history except those of knowledge and reason nor of any tool except that of true intelligence.

The future? The future-as-history is a mystery made of chance and expectation, an insubstantial creature of contingency and human hope. There is no tomorrow for the future-as-history unless it be viewed in the perspectives of ageless conflicts between man's fate and man's will and the alternations of idylls and catastrophes. The mind peers darkly into cycles of human greatness and long oblivions of man's estate and can espy only the ceaseless struggle between necessity and freedom projected through over-arching stretches of time between a past that is no more and a future that may not be.

Where, then, on this flying trapeze of time which is history does the mind "pitch camp," so to speak, to gain its perspectives on flux? The present alone can clarify and vivify the past, though it cannot automatically conjure the future-as-history either as a mechanical or existential frame of time. For the past as such is inert "mass" of memory, the accumulated, voiceless debris of all "that has actually happened" to man.

History is a mere wastrel of Time until it is "adopted" by knowledge and vision and is nursed and then transmuted by human intelligence grappling with the riddle of truth. And the mind cannot find rest except in the restless pursuit of meaning and idea. All these together give history structure and a human habitation in the active remembrances of things past. Not passive memory, nor chance recollection floating in the "stream of consciousness," history is a strenuous quest, a recurrent re-discovery, intellectual action, a conquest always in need of vigilant self-renewal. No "perspectives on tomorrow" nor on man's yesterday's can even tentatively be envisaged either by an irreverent, witty "futurist" or by an antiquarian worshipper possessed only of reverential devotion to the past as mere past. For history is neither radical nor reactionary, neither liberal nor conservative, neither pastoral nor revolutionary, but all of these things together and yet there are still more things in it than are dreamt of in the pettiest or most grandiose philosophies of men in search of self-justification. History "proves" everything and absolutely nothing; it embraces men's desires and mocks at human illusions; it cries out with boundless pain and sings of godlike human greatness.

If there is any "common denominator" in history, it seems to me, it is perhaps the presence, a conflict and interplay at the same time, of the dual element of continuity and discontinuity. Continuity and discontinuity, however, are only abstract concepts if they are not studied in actual operation but contemporaneously on two different yet strictly related historical levels. Permit me, momentarily, to refer to these, through a kind of semantic shorthand, as the "vertical" and the "horizontal" levels of operation.

On the vertical level, the past, considered as "all that has actually happened," cannot but tend to condition, but not to determine, this present moment; the future, on the other hand, cannot but be inferentially "influenced" by both this present moment and its past. But the future, if it is never completely free to develop as it pleases, is likewise never absolutely fated to emerge and "go" in a particular direction. This strange antinomy apparently results, in its turn, from something which is continuously occurring on the other, the horizontal level, of the "historic process."

Every moment of history reveals, if only for an infinitesimal span of time, an actual conflict or a potential cooperation between necessity and freedom. What is often called "historic necessity" may cover a multitude of historical sins but, essentially, it involves the idea that some part of the past, large or small as it may be, will be judged, will actively operate, so to speak, in dragging itself along, pushing forward, in pulling something of itself beyond the present. This "something" which the past seeks to "project" before itself, either materially or ideally, may be of a very elementary or of a very complex character: it may, in a sense, vary in nature and stride from the elephant's gait to the eagle's flight. To say that someone or something was or is "behind the times" or "ahead of the times" frequently represents a very rudimentary and popular, if fundamentally mistaken, way of referring to this phenomenon.

More importantly, whether in those spheres which the historian has been reluctantly losing to his more aggressive colleagues working in C. P. Snow's other "culture," that is, in the theoretical-scientific and technological (but also in the psychological, social, and economic) fields or in those regions which the historian has not sufficiently or efficiently enough cultivated in his own garden (philosophic systems, artistic phenomena, religions, moral, and spiritual activity, and the arts of the imagination), one can observe a tenacious "push" by the past. No philosopher, however bold, no artist, however original, no theoretical scientist, however "revolutionary," has ever fully escaped the history of some system of ideas or the creations of previous geniuses or the conceptual frameworks of some preceding scientific structure of reference.

The recurrence of certain large problems in history is a function of the pres-
sures of "historic necessity," at its best and at its worst, against the present and the future. If we had the opportunity and desire to elaborate upon this aspect of the question, we would not go a-begging for examples of how certain big world problems cannot but tend to re-appear on the historic horizon of our "perspectives on tomorrow."

But there has been, is, and will be also freedom operating in history. Human freedom, in this sense, refers to that area of activity encompassing the sphere of man's choice: the freedom to choose between alternatives of decision, varieties of action, survival and true existence, historic "monologues" and constructive dialogues between cultures. These choices, in their turn, subsume the possibilities of activating human will, of assuming intellectual and practical and moral responsibilities, of acknowledging the possession and of asserting the faculty of ethical rationality in history. Freedom is a reality in these regions of thought and action. Freedom must be asserted as a reality and sought and cared for as a function of human history if the most hopeful "perspectives on tomorrow" are not to be forfeited by defection to the almost omnipotence of tomorrow's-freedom is the test of the human condition.

In history—yesterday's, today's, and tomorrow's—freedom is the test of the human condition.

Those who have played and would continue to play always only one side of the "record" of the human condition—the side labelled "historic necessity"—must be asked to turn it over and listen to the other side—that which is marked "human freedom" and responsibility. For, contrary to what our school-children may be led to believe by unimaginative, overworked or flippant pedagogues, there are not just "facts and dates" in history but also scales of immanent human values. And life is a value, love is a value, freedom is a value, justice is a value, truth is a value.

It will no longer do, as it has never done for historic societies and civilizations that have been worthy of their names in the roster of man's great achievements, to invoke "historic necessity" as a shield for historic irresponsibility, as an escape from freedom.

In times of great crisis, in eras of decision, when triumph and defeat hung in the balance, there were always men who cried out and "acted" without fear as the conscience of their respective civilizations. . . All of these, whatever historical and spiritual worlds divided them, held faith with the highest human values. They did not play with ideas, they did not rationalize away either the limits or the potentialities of human thought and historic action, they did not deny man's responsibility for man's fate in history.

With us, in our civilization, in our time, it is the escape from freedom that has been the greatest danger and still constitutes the greatest and most deadly temptation. The temptation must be resisted, the danger must be avoided.

When a war breaks out, it is not necessarily the "will of God" or of "history" at work that we must seek, but somewhere, somehow, some human element that did not do its best to foresee and to prevent its coming. When four little girls are assassinated by a bomb-explosion at a Sunday school, it will not do to search on the "perspectives" of yesterday for an imperative iron-chain of "historic causality" running back to the American Civil War.

We must not believe him when a fallen dictator who for twenty years had strutted amid sounds and fury and self-exaltations upon the stage of his beautiful, tragic country, Italy, which he had brought to shame and ruin, confesses his "impotence" to one of his last interlocutors with the words:

Hitler and I have surrendered ourselves to our illusions like a couple of lunatics. We have only one hope left—to create a myth. . . One day history (sic) will judge us and say that many buildings were built, that many bridges were thrown across many rivers; but it will be forced to conclude that, as far as the spirit is concerned, we are only common pawns in the recent crisis of human conscience, and that we remained pawns to the end.

But we cannot, we must not any more accept, even hypothetically, the immorality of any "historic justification" of the abuses of power and we must strenuously resist all forms of the totalitarian corruption of history. When millions upon millions of human beings are innocently, helplessly sent to die in the gas-chambers it will not do, in those "perspectives on tomorrow," to see in every new Hitler the "pawn" of "historic destiny," merely the expression of a national or of a "spiritual crisis," and in every new Eichmann only a small, insignificant, administrative link in a chain of command which evaporates in responsibility the lower it runs down to a "functionary," the higher it rises to a Fuehrer supposedly spawned directly by the marriage of "fate" and "history."

The possession of nuclear power first by one nation alone, then by two, now by four, and, alas, still more to come, may perhaps be "explained" away, as some have plausibly tried, through the complex but over-accessible category of "historic necessity." But whether nuclear power is to be used or not, whether it is to be controlled or allowed to expand, whether it is to be neutralized or potentially and practically "activated" are questions not of "historic necessity" but of human decision. Whether to put that nuclear power to the uses of war or of peace, of some benefit to humanity or of total destruction, to the test of godlike possibilities or of demonic annihilation: these, indeed, belong to the realms of choice, of human will and decision, of historic and moral responsibility. Those choices belong to the sphere of ethical rationality in the service of human life and of human freedom.

Not to recognize or try to understand, not to give due importance and dignity to the spheres of choice in history—past, present, and future—is only to diminish man and to use and abuse history for the ends of human folly. For to know, at least to seek to know, where man is limited and where he is free in history, where the interplay of necessity and freedom actually operates in human affairs, and how it operates, and in what ways it can continue to operate, is, in my humble opinion, an endeavor truly calculated to add to the stature of man. Only thus can man help to give flesh to his dignity as a creature of God and of history; only thus can man maintain or restore himself to his proper estate not as helpless victim but as a true molder of his own destiny.

I know only too well that to assert, to emphasize the reality of these realms of choice in history is to expose one's self to the accusation of "idealism" and "ingeniousness" always ready-made on the lips of the pseudo-sophisticates of "intellectualistic" history, whatever that may be. For the modern sophists, who love to wallow in the mental acrobatics of relativism and self-adoration, the so-called "trends of the times," which are merely "perspectives" or activist and egotistic "projections" on "tomorrow," demand that one ride the apparently overwhelming "waves" of the present and of the future.

If to re-assert the presence and interplay of necessity and freedom in history is to be guilty of the sin of "idealism" and of the crime of "ingeniousness," I, for one, am prepared to plead guilty to the sin and strenuously reject the crime. The "sin" I accept and the "crime" I reject are, in fact, absolutely different functions of a vision and meditation on the meaning of human history.
For we, too, know something of the origins, nature, and finalities of the self—assertingly “realistic” alternatives to a humanistic reading of history. Attractive and treacherous at the same time, those “alternatives” represent some of the most demonic temptations faced by the modern mind, East and West. Let us, for the moment, see them riding by, these four horsemen of the “intellectualistic” Apocalyptic, which would have us renounce our passionate faith in the freedom of history by showing us the splendors of the kingdoms of necessity. For, unlike ancient Gaul, these kingdoms of necessity are four or, at least, modern and contemporary philosophies of history have reduced them to four aspects of a single commitment, each in its fashion acknowledged the rule of the dark, imperious queen—Necessity: Historicism, Existentialism, Determinism, and Cyclicism….

We cannot but acknowledge that we have learned much from the philosophical “alternatives” represented by historicism and existentialism, but we have found little that is relevant to the present and future condition of man in the pseudoscientific iron-laws of determinist philosophy and cyclicism. The mind of the West, our mind, has been and will be open to the undreamt of possibilities of human life exactly because we believe in the freedom of history and in the active coexistence of a multiplicity of roads to the truth—in history, in philosophy, in science itself. We are willing to put to the most arduous test the very bedrock of our faith in the freedom of history. But we have the right to demand the same rigorous self-questioning of the premises and finalities of the search for truth of all those with whom historic and spiritual dialogues are necessary for the sake of human life and the freedom of history.

We do not believe in the self-complacent dogmatism of those systems and disciplines nor in the compulsiveness of those philosophic and scientific orders of knowledge which proffer “automatic transmission” as the answer to all the difficulties, the uncalculable risks and possible break-downs of the delicate, the unique non-machine of human intelligence on the crowded roads to truth. Above all, we emphatically reject all pseudo-scientific and metahistorical “alternatives” to the ceaseless human quest for the meaning of history and the value of life. We repudiate as false those dilemmas which would imprison history and the human spirit in the grip of inescapable Either-Ors. Certainly at this point in our history, in the history of the West, in the history of the most stupendously “free” and dangerously munificent George Bernanos offered his variation on Valéry’s theme: “Those who despair of my country should first despair of the world in which they are living, because it is that world that is falling to pieces….” But in that apostrophe and in that variation we heard once again the echo of the dirge-like meditations of that supreme “realist,” that man of the world, diplomat and historian, who was Francesco Guicciardini, Machiavelli’s great compatriot, when, in the wake of the ruin of Florence and Renaissance Italy, he wrote in his Ricordi:

All cities, all states, all kingdoms are mortal, since either by nature or by accident everything in this world must at some time come to an end.

But the citizen who happens to be living when his country is in its decline should not so much lament over its unhappy fortunes as over his own. For his country only suffers what it was fated to suffer. His is the infelicity of being born at such a time when his country has to fulfill its doom.

Such as these are magnificent illuminations on the human condition. They are the truths of art and of poetry, revelations of the self-reflecting human intelligence, the consciences of their ages face to face with tragic disasters. They are statements beyond appeal of cathartic truths which, in different tones, we have heard before in the haunting voices of Antigone and Hamlet and shall not tire of hearing again and again. But such truths, tragic as they are, illumine the human condition, they do not bind it; they ennoble, not degrade; they tend to free man, not to imprison him, exactly by touching and sounding the depths of despair and therefore suggesting the heights to be scaled if man must live, not die, in history.

And yet, in this our time, even such illuminations, even such poetical truths cannot be allowed to dominate our his-
toric consciousness and our historic destiny. For now we cannot even repeat Valéry's apostrophe: *Civilizations, you are mortal!* without shuddering at its implications for our fate. For we have walked in the shadow of death again and again, we have stood on the perilous brink of absolute, total catastrophe, and we have had to envision the end of man, the utter annihilation of history, but in a fashion that no poet, no philosopher, no historian could have dreamed before our time. For us, *not the idea* of history, but human history itself has stirred on the dark abysses of folly and death.

The time is now for man to be "something more" than he can gaze upon or foresee. ... He cannot console himself with mere remembrances of sweet things past in human history. He cannot seek refuge in anodyne "peace of mind," in easy "social faiths," in mere extra-curricular labors on behalf of his destiny. Human history will not survive through merely private existential fantasies of salvation or through the search for the hopeless perfectibility of the new "caves of men," the fallout shelters. Man will hardly subsist only in the steel-and-glass "earthly cities" created by science and technology and in the suburban "heavenly cities" projected by "social engineering" and self-complacent ideologies. All these will be but brittle redundancies and will hardly matter at all if, in such a fateful circumstance as he now finds himself, man does not reassert *in fact*, not merely as an intellectualistic exercise, *in will*, not merely in desire, *in strenuous labor*, not merely in maim hope, the *limits of all "historic necessity,"* the *possibilities of all human freedom in history.*

No chain of fatality binds our civilization to a tragic end. There is no iron inevitability in any political collapse, no inescapable determinism in any moral catastrophe that can overwhelm and annihilate us. The sphere in which the deadly game between necessity and freedom operates in history has not been and need not be foreclosed. And it is only in that sphere that lies the difference between preservation and ruin. Choice, not chance, intelligence, not fear, freedom, not fatality, stand between today and all "perspectives on tomorrow." Not any force nor law nor accident nor science but man alone has it in his power, in the free will of his spirit, in the solitude of the individual conscience and in his fearless, faithful solidarity with all mankind to *decide that history—*this tragic, wondrous, multitudinous creature he has molded—shall not have an end.

(Copies of the complete text of Professor Salomone's address may be obtained from the Office of Alumni Relations, University of Rochester, Rochester, New York 14627.)

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**PERSPECTIVES ON TOMORROW: A BIOLOGIST'S VIEW**

**Aser Rothstein, ’42G**

Associate director of the University's Atomic Energy Project and vice-chairman of the Department of Radiation Biology, Professor Rothstein is currently engaged in research on the cell membrane. He came to Rochester in 1940 as a graduate student and, except for a year abroad under a National Science Foundation fellowship, has been here ever since.

While desperately looking for a theme for my talk, I discovered an old parchment in a dusty corner of the new Medical School Library, on which was inscribed an appropriate limerick—obviously the product of some great, if anonymous, philosopher.

> A curious animal is man—
> His future he thinks he can plan.
> But events unpredictable,
> And acts contradicable
> Put man and his plan in the can.

You will note the element of guarded pessimism and basic insecurity which is as appropriate today as it was in the past. I feel this insecurity doubly, first as a member of the human race faced with seemingly unmanageable problems, and second as an individual faced with the task of defining for you the "perspectives on tomorrow—a biologist's view."

The phrase "perspectives on tomorrow" implies an extrapolation of trends and knowledge of the past toward predicting the future. I have never been a particularly good prognosticator. My son will point out that I picked the Yankees to win the last World Series, a presumed event which had all the force of logic and statistics behind it. It seems to me that certain individuals are in an advantageous position in looking ahead. For instance, the President has no difficulty in making predictions that are reasonably accurate. He predicts that man will reach the moon by 1965 or 1970. At the cost of 20 billion dollars and several ulcers in the Space Agency, the prediction will probably come true. President Wallis predicts that the University of Rochester will be one of the great universities of the future. Perhaps he even looks forward to the day when he can replace me with a teaching machine. With 50 or 60 million dollars from the trustees, the predictions will undoubtedly come true. It is a well known law of gambling that for those who exert a measure of control over the role of the dice, it is safe to bet. But I am not a president. I am, like most of us, primarily a controllee rather than a controller, so I must make predictions without myself having much individual control over the course of events. But it is nevertheless important that I recognize the existence of control that man collectively exerts over his own destiny. It is the existence of such control that differentiates man from the rest of the earth's life forms. It is the erratic, illogical, and often unpredictable nature of the control that puts man beyond the ordinary rules of biology and gives employment to historians, sociologists and anthropologists.

When I speak of control in this context, I mean the conscious manipulation of the environment for some real or imagined benefit. To illustrate the point, I wish to contrast the differences in the relationships of man to his environment with the relationships of other forms of life to their environments. The environment for a given species is most complex, including physical factors such as temperature, rainfall, the nature of the soil, and the nature of the sea, and biological factors such as the plants and animals it eats, the animals or bacteria that attack it, as well as...
as internal factors such as aging, breeding habits, and evolutionary changes. The impact of these and of all other variables acting simultaneously is terribly difficult to assess, but the biologist can find simple situations that exist in nature, or that he can perform in the laboratory in which only one or two factors are varied, in a controlled manner. For example, a simple ecological system can be constructed from microscopic protozoa that eat bacteria, a culture of the bacteria that they eat, and some nutrients for the bacteria. Initially the bacteria will grow rapidly in number because the medium is rich in nutrients and because their generation time is short. Soon, however, they will begin to deplete the nutrients, and at the same time the protozoa, having lots of food, will reproduce rapidly. Consequently, the numbers of bacteria are soon reduced to the level at which the protozoa are relatively hungry and in little mood for reproduction. The two populations are now in a state of balance, with stable numbers of each, a balance that will be maintained until the bacteria begin to run out of nutrients. They will then almost vanish, leaving the experimenter with a jar of hungry protozoa to worry about.

Another example is one that occurred recently, reported next to some attractive Burmese girls, in the National Geographic magazine of February, 1963. It is entitled "Wolves versus Moose on Isle Royale" by D. L. Allen and L. D. Mach. Isle Royale is in Lake Superior, fifteen miles from the Canadian shore. In about 1912 some moose found the island by swimming or by crossing on an ice bridge. They were able to thrive on the abundance of stems and twigs and leaves. The population doubled and redoubled, and became the island's most famous attraction. Isle Royale eventually became over-populated, with as many as 3,000 moose. The food supply became inadequate and the population decreased because of disease and starvation, a decrease that was accelerated in 1936 by a fire that ravaged a large section of the forest. However, after the big burn a new growth of brush vegetation developed which is ideal moose food. The herd began to increase in size, but before the population got out of control again, wolves invaded the island, first in 1949. A balance has now developed among moose food, moose, and wolves. The moose population is stable at a level of about 600, and the wolf population at 20 or 30. In the balance, about 200 moose calves are born every year, and about the same number die from accidents, drownings, disease, and wolf killing, the latter accounting for about 70 moose.

Important conclusions can be drawn from the simple examples that I have described. Populations in a given environment develop interrelationships with each other, a most important one being the food chain. In each case a stable balance of the various populations tends to develop, in which the birth rates and death rates are approximately equal. Most ecological systems are much more complex than these examples, but the same tendency toward balance exists in each case.

Drastic changes in ecological balance can occur through changes in the physical environment, either natural or man-made, or through changes in the biological environment. At the Brookhaven National Laboratories at Long Island, for example, an area of forest is being experimentally subjected to fairly intensive irradiation. The ecological system under test is a stable but complex one, called climax forest, involving evergreen trees, deciduous trees, shrubs, ground cover, insects, birds, and animals. It is typical of areas that have developed on glacial sandy deposits found in many parts of the northeastern section of North America. The effect of radiation is greatest, of course, close to the source of irradiation where only resistant plants survive. At a greater distance only the most sensitive forms such as pine trees are damaged. In addition to the direct effects which are related to radiation sensitivity, secondary events occur due to the disturbance of the ecological pattern. For example, the death of the trees resulted in a great change of environment for the ground cover which was not well tolerated. The entire inter-relationship of tall trees, small trees, small plants, insects, birds, and animals was completely altered. Whenever one component of an ecological system is disturbed, all other components are disturbed and the whole must readjust itself to a new balance.

The consequence of changes in the biological environment can be just as drastic as changes in the physical environment. Sometimes a relatively stable system gets out of control, but usually explosive changes result from an invasion of an ecological system by an outside organism. Many examples are familiar to all of us: the Bubonic plague, the influenza epidemics, the potato disease in Ireland, the lampreys in the Great Lakes, the Dutch elm disease, and the chestnut blight that destroys beautiful trees.

Ecological patterns are also modified by internal changes in individual organisms. Within a population of a given species, individuals are somewhat different from each other. The variability is maintained by a mechanism of reproduction which is suited for recombining the variants in every conceivable way. Some of the combinations may be disadvantageous in a particular environment and because of a slower reproductive rate or higher mortality, these combinations will tend to be weeded out. Other combinations have no great advantage or disadvantage and their frequency in a population depends primarily on chance. Still...
other combinations are advantageous and these will tend to increase in the population. Because of the constant interplay of mutation, recombination, and selection, species in general are well adapted to environments in which they have lived for a long time.

The importance of variability within a population is most apparent when a drastic change of environment occurs, when new selective factors become important. For example, the dinosaurs were well-adapted to their environment, but when environmental changes occurred there were no individuals among them who could survive and breed in the new environment. Another example concerns our use of antibiotics. These represent a new factor in the environment of bacteria with which many of them cannot cope. However, a few variant individuals in a bacterial population may be resistant. Consequently the sensitive organisms disappear and the new bacterial population is derived from the resistant forms. The next time around when the antibiotic is given, the doctor says, "Sorry, a resistant Strep." It can be concluded that drastic changes in environment may result in disappearance of some species, survival of modified forms of other species, and a complete readjustment of the ecological balance.

Before I proceed further, I want to confess that I am a sort of biologist but I am not an ecologist, a geneticist, nor an evolutionist, so that the picture that I have given you was certainly over-simplified. It may have given the impression that biologists have determined all of the rules and laws that apply to the delicate balances between organisms and environments, and the ebb and flow of populations responding to changes in the environment, or to changes in the genetic structure. This is not true. We do know the shape of the rules if the details and the goals of more total knowledge are within reach. At one end of the spectrum, complex mathematical models can be tested with the aid of computers to try to account for the many variables that act simultaneously on the balance of populations. At the other end, studies of biochemical genetics are giving insight into the nature of the genetic code in chemical terms. Such knowledge will have tremendous impact on knowledge of inheritance and evolution.

Regardless of detail, the biological rules have one basis in common—that is, that the array of biological material, no matter how complex, always tends to adjust itself in some balanced relationship to the environment. When we look at man, however, we find that he breaks this basic rule. Instead of living in a proper biological manner and adjusting to his environment, he has adjusted, to an ever greater degree, the environment to his own desires. Let us look back through the history of man and list some of his perversions of the natural order. He was not satisfied with his dependence on the natural supplies of food, so he domesticated and bred his own animals and he domesticated and grew his own crops of plants. He was not satisfied with the physical environment that limited his crops, so he developed systems of irrigation. He was not satisfied with the kinds of crops that were available, so he bred new ones—not for their survival value in a natural situation, but for their yield in food in his controlled environment. He added fertilizer to increase the fertility of the soil, and destroyed the pests that disturbed his crops. As a consequence, the bulk of the population need not be concerned with the life-dependent problem of gathering food, but can be concerned with cultural pursuits such as making television sets. More recently man has interfered with the laws of nature in another way. With explosive developments in the field of medicine and in the related fields of child care and nutrition have come a decrease in child mortality, miraculous cures for many diseases, and a large increase in life expectancy.

Not all of man's interference with nature has been to his advantage. He has lost forests, worsened climates, produced deserts, polluted streams, smogged the atmosphere, produced fall-out, mechanized war—and he may even blow up the world.

In order to understand the development of the man of tomorrow we must try to assess the biological changes and the changes related to man's attempts to control his environment. The two factors have been contrasted in a recent article by Harold F. Blum in the American Scientist, March, 1963, in terms of the evolution of man in a biological and in a cultural sense. Evolution in a biological sense has already been discussed. It involves the existence of continuity from generation to generation, in which information is passed in the form of genes in the chromosomes of the sex cells that form the new individual. The changes in genetic constitution within the population and selection based on environmental factors work extremely slowly with reference to the length of a lifetime. Thus, several predecessors of modern man were predominant forms for several hundred thousand years. Modern man, on the other hand, has been predominant for only 40,000 years, and he must be treated as a relative newcomer on the evolutionary scale of time. The historical period, the last 5,000 years, is but an insignificant instant, a speck, in terms of biological evolution.

Cultural development follows an entirely different pattern. Here the transfer of information is by direct communication. One individual can pass knowledge to many others. As communication between groups of men has increased, as better means of communication have evolved (such as language, writing, printing, radio, and even television) knowledge has spread more and more rapidly. At
the same time, because knowledge is built on knowledge, the total quantity of this commodity has doubled and doubled again. Innovation is built upon innovation. Consequently the rapid growth of knowledge and its rapid dissemination have resulted in an ever increasing rate of cultural evolution. For those of you who are mathematically minded, it has been estimated that various aspects of cultural evolution have grown at exponential rates varying between the power of three and the power of nine. For each doubling in time, knowledge increases by eight- to 500-fold. This means that culture is now developing at an explosive rate. For example, stone tools evolved and were the mainstay of man's culture for about 200,000 years. Metal tools appeared only 10,000 years ago. The industrial revolution is 100 years old. And now we are rapidly going through the age of automation. The time scale has been so speeded up that we no longer have cultural stability. Until the present age, the ways of life did not change very much within the lifetime of one man. But now the pattern changes before our very eyes. We may not see stability, in this sense, again, and therefore we must adapt to constant change.

Let us compare the interrelationships of cultural and biological evolution. For the first hundreds of thousands of years, biological evolution was the most important factor. Man's ability to cope with his environment determined his success. But in the last few thousand years, and especially in the last hundred years, the pattern has changed completely. Man has learned to control his environment to such an extent that his environment selected those variants of man who would never make it in the forest or jungle were good at planting and harvesting. In more recent time, the elimination of selective forces has proceeded rapidly. Many external diseases have been conquered. Even individuals with inborn genetic defects, such as defective blood vessels and heart valves or diabetes, now live to a reproductive age and beyond. In essence, man no longer adapts his genetic constitution to his environment, but has learned in large part to adapt his environment to his genetic constitution. Consequently biological evolution in the normal pattern will no longer occur.

At the present time, the rules of the game of life for man are primarily the rules followed by cultural evolution. Biologists, by reason of their special training, have no special insight into these rules. This is the game of the politician, historian, social scientist, and philosopher (not that some biologists are excluded from possession of the additional skills to play this game well). Biologists provide an ever enlarging base of knowledge on which the cultural pattern is built in part. They can predict, with confidence, the directions in which biological knowledge will go in the future. They can see present and future biological problems and potential methods of solution. They cannot, however, claim special insight into the behavior of man. He may use the biological knowledge wisely or unwisely. He may develop a Utopia or he may make life intolerable by overpopulation or radioactive contamination. Here the biologist finds himself in the company of other informed men, knowledgeable about the potential dangers and raising his voice to them, but with a strangely impotent feeling of being carried along a path that follows its own mysterious logic.

Although I have already used up the major part of my time, I have presented, in reality, only an introduction—a summary of my special credentials as a biologist to look at the future. To be honest with you, my credentials are somewhat false. I am a biologist, it is true, but my specialty is cells (in fact, one small part of the cell) and not human biology. In a sense, this high degree of specialization represents the impact of what I have called the cultural evolution on the structure of biological science itself. Knowledge has grown so fast and techniques have become so sophisticated that a single person can only keep up with, and work with, a small segment of the whole. Just as the whole population of men must face the explosive rate of change of the total culture, the biologists in their own smaller sphere must find ways of coping with a bewildering rate of scientific development. To compound this problem, the whole structure of biological science is changing. Disciplines of biology that once were relatively distinct are now merging. At one time it was easy to tell a geneticist from a microbiologist, from an anatomist, from a biochemist, from a cellular physiologist because the work of each bore little direct relation to the work of the others. Each had his own language, techniques, and theories. But the distinctions were, in reality, artificial. They existed simply because we did not know enough to see the common elements. This is no longer true. Genetics cannot be discussed without also considering the biochemistry of the nucleic acids, the theory of coding, the anatomical and molecular structure of the chromosomes, the physiology of the cell, regulation of synthetic function, etc. The boundary lines between disciplines are becoming almost an administrative relic. Furthermore, the impact of chemistry, physics, and mathematics on biology is increasing rapidly. The biologist is now faced with the task of being expert in chemistry, physics, mathematics, genetics, biochemistry, physiology, etc., in order to be in the forefront of any particular specialized field. If this sounds difficult, I can assure you that it is, but the result is going to be an explosive development of biological knowledge. I am confident that biology will become the glamar field of science for the next period of time. It is already beginning to attract more and more outstanding students. But just as man in general must learn to live with a rapidly changing cultural base, biologists must learn to deal with the changing nature of biological science. Trends are already visible. Students are being drawn into biology with advanced training in chemistry, physics, or mathematics. Our own Medical School, for example, is worried about how to teach the new areas of knowledge that cross the lines of all the old disciplines such as biochemistry, physiology, and pharmacology. We are faced then with two related problems: the problem of dealing with a staggering rate of increase of knowledge, and the problem of reorganizing the administrative structure of our science so that it is more in keeping with reality and will allow us to more efficiently teach and carry out research in modern biology. These problems are far from solved.

I want to conclude on an optimistic note, so I would like to quote another verse from that old parchment I mentioned at the start of my discussion:

As yet unforeseen on the morrow
For man is a triumph or sorrow,
He'll inherit the earth
If he shows his true worth
And from heaven not hell he should borrow.
WILLIAM B. GILES, '63,
is a member of the University's cyclotron staff. He is also a
photographer of uncommon talent and sensitivity, as was evident
this fall to returning alumni and other River Campus visitors
who viewed his recent one-man show at the Fine Arts Gallery
in Rush Rhees Library.

That show—Between Two Worlds—now is en route to galleries
on the West Coast; other Giles photographs currently are
on display in leading group exhibits (Photography in the Fine Arts,
Photography 63) throughout the country.

Rochester Review is pleased to present a sampling of works
by this gifted young artist.
FOR MEDICAL RESEARCH  To help provide the increased facilities needed by the School's flourishing programs of medical research, the National Institutes of Health have awarded the School a grant of $3,172,736—third largest in the history of the Institutes.

The grant will provide nearly half of the estimated cost of $7.1 million for a building project to be added to the Medical Center complex; the University is to provide the matching funds needed.

Included in the new construction will be laboratories and associated facilities for research and graduate training in the medical sciences, and a new structure to replace the present animal house, erected 40 years ago as the first of the Medical Center buildings.

Although the School's research budget has tripled since World War II, there has been little expansion of physical facilities for research, Dean Donald G. Anderson notes.

In addition to providing adequate space for research projects which have outgrown their present quarters, the new facilities, according to Dr. Anderson, will "make possible the start of important new research in several departments. Among these are radiation biology, genetics, microbiology, pathology, pediatrics, pharmacology, surgery, and a number of medical specialties such as neurology and dermatology."

FACULTY NOTES  Dean John W. Graham, Jr. of the College of Engineering and Applied Science has been named by Governor Nelson A. Rockefeller to the New York State Advisory Council for the Advancement of Industrial Research and Development. Thomas A. Keenan, director of the Computing Center, has been elected chairman of a new organization of university computing centers established by the Association for Computing Machinery. Ronald A. Leonard, associate professor of violoncello, was awarded second place honors in an international 'cello competition in Budapest this fall.

Eleventh in the succession of R. T. French exchange professors, William B. Muchmore, associate professor of biology, is spending the year in England, where he is engaged in teaching and research in the department of zoology at the University of Hull. The new secretary-treasurer of the Association of Graduate Schools, part of the American Association of Universities, is Professor S. D. Shirley Spragg, dean of the University Council on Graduate Studies and chairman of the department of psychology.

The 1963 Gold Medal of the University's Medical Alumni Association has been awarded to Charles E. Tobin, professor of anatomy.

AID TO EDUCATION  Convinced that the flourishing of private higher education is as important to the future of business and industry as air and water, the Xerox Corporation this fall announced a plan of aid to education through which it will give to privately supported colleges and universities about one percent of its estimated profits before taxes each year. Most of the donation will be given to Rochester-area institutions.

"This year's total contribution will amount to $380,000. The biggest share, $200,000, will come to the University of Rochester.

Xerox president Joseph C. Wilson, '31, who is also chairman of the University's Board of Trustees, said the firm is acting in enlightened self-interest. "The support of excellent education is to us a necessity," he noted. "Our roots are deep in Rochester where are our plants, laboratories and headquarters. . . . We are growing so fast that we must attract and keep people of real intelligence right here."

VISUAL FOCUS  A Center for Visual Science, patterned after the University's interdisciplinary centers in brain research and space sciences, is being established with Robert M. Boynton, professor of psychology and optics, as director. The new center will offer graduate training and research in the physical, optical, physiological and psychological aspects of visual science.

Among the University divisions collaborating in providing faculty for the center will be psychology, optics, brain research, electrical engineering, and ophthalmology. Graduate students will receive their Ph.D. degrees through existing academic departments, but will receive intensive laboratory training through the center's programs. The new unit will use present laboratory facilities until a new visual science laboratory is constructed, hopefully within the next few years.

As its first project, the Visual Science Center is planning to sponsor a series of colloquia, seminars, and workshops featuring leading specialists in the field.

HANSON HONORED  As a tribute to Howard Hanson, who will retire at the end of the current academic year as director of the Eastman School of Music, the River Campus colleges presented a concert—"A Salute to Howard Hanson"—in Strong Auditorium on November 17. Made up exclusively of compositions by Hanson, it was Rochester's first all-Hanson concert.

Performers included members of the Rochester Philharmonic Orchestra conducted by Ward Woodbury, director of music for the River Campus; the combined
Men's and Women's Glee Clubs, also directed by Woodbury; and the new Orpheus-Cecilian Chorale, Allan Ross, director. Guest artist was Armand Basile, professor of piano at the Eastman School.

Featured were "Mosaics," "Fantasy on a Theme of Youth," "Lament for Beowulf," and the Third Symphony.

INTELLECTUAL INQUIRY The preceptorial courses for freshmen introduced last year on an experimental basis have, as the result of the enthusiasm they aroused, been expanded to include new courses in English and the fine arts. Last year three such courses were offered in the departments of anthropology and sociology and foreign and comparative literature.

Similar to the honors programs for juniors and seniors, the freshman courses offer special opportunity for intellectual inquiry in small classes of 10 to 15 students directed by a faculty preceptor. The freshmen selected for the courses are expected to undertake intensive reading, to participate in seminar discussions and critiques, and to learn some techniques of scholarly investigation.

CHAIN REACTION The many mechanical devices that make up a school's audio-visual department make excellent teaching aids—once the human being assigned to operate them has mastered the instruction manual. By utilizing the audio-visual devices in a novel chain reaction technique, the College of Education is teaching its students how to use tape recorders, motion picture projectors, et al., by offering them plenty of practice in using one machine while learning how to operate another one.

Under the experimental program, the student receives his first lesson—on how to operate a tape recorder—from a conventional manual. When he puts his new knowledge to work by operating the tape recorder, its sound track teaches him how to run a slide projector, which in turn hands him on to a movie projector, which shows him how to run an overhead projector.

The audio-visual laboratory has made it possible for students to complete their audio-visual training in a matter of hours—far faster than would be possible in standardized classroom sessions. The lab was developed by two faculty members at Rochester and Syracuse universities under a Ford Foundation-sponsored Inter-University Program involving the colleges of education at Rochester, Cornell, Syracuse, and Buffalo, as well as area school systems.

BUT NOT FORGOTTEN After 33 years on the Medical School faculty, Dr. Richard C. A. Jaenike, associate professor of psychiatry, retired in September. For many years he served with distinction as psychiatric consultant for the Rochester and Monroe County schools, courts and social agencies. Among many other community activities, he was instrumental in starting the Red Cross psychiatric program. He was acting chief of the University's psychiatric division from 1938 to 1946.

Also missing from the Medical Center this fall is Mildred E. Walter, '21, who retired in November after 34 years as Medical Center librarian. Her successor is Stanley D. Truelson, Jr., formerly librarian and assistant professor of medical bibliography at the Upstate Medical Center in Syracuse.

SHHHH! "Music for Quiet Listening," a record album designed to have a soothing effect on the high-strung public, has been issued by Mercury Records. Performed by the Eastman-Rochester Orchestra under the direction of Howard Hanson, the record includes nine of the compositions which have won the Benjamin Award for "restful music" presented to an Eastman School student each year at the Festival of American Music. The awards were established by Edward B. Benjamin, New Orleans industrialist.


AN ENDURING GIFT TO MEDICAL EDUCATION

Another major gift to the School of Medicine and Dentistry—a fund that will assure the continuing development of the Edward G. Miner Medical Library—has been made by Dr. George H. Whipple, dean of the School for its first 32 years.

To be known as the Whipple Medical and Dental Library Fund, it is expected to exceed three-quarters of a million dollars over the next several years and will bring the total of Dr. Whipple's gifts to the University to some one-and-a-half million dollars.

In 1955 Dr. Whipple established three Medical School endowment funds—for a professorship in pathology, scholarships for medical students, and a series of visiting lectureships. The new gift is entirely separate from these earlier funds, which were established as a result of Dr. Whipple's research on anemia.

Dr. Whipple, who retired as dean in 1953 and as professor of pathology in 1955, continues his research in his laboratory in the Medical Center.

Coincidental to his 85th birthday in August, J. B. Lippincott Company published Dr. Whipple's biography, written by Dr. George W. Corner, his colleague at the Medical Center for twenty years. Dr. Corner was first professor of anatomy at the School and later became director of the embryology department of the Carnegie Institution and historian of the Rockefeller Institute.

The book, "George Hoyt Whipple and His Friends," details the life story of the Nobel Prize-winning pathologist who was largely responsible for the present highly respected position of the School.
1920
Paul McFarland will retire at the end of the year as public relations director of the Broome County United Fund and Social Planning Council. Formerly public relations director of the UR, he was for 10 years a member of the editorial committee of the Rochester Review.

1923
Jra. M. Wilder, '34G, who resides with his wife Evelyn Hooper Wilder, '30, in Floral Park, N. Y., returned to UR for the "African Affairs" course last summer, under a N. Y. State Education fellowship. Active in the National Association of Manufacturers, Wilder spoke at the annual congress, where he received a special award.

1924
Edward W. Vick, formerly assistant to the president and assistant secretary of the New York State Electric & Gas Corp., has been named vice president of the firm.

1925
Eleanor Dutton Franke was married to W. Harold Donnelly in Rochester August 16.

1926
Margaret E. Butterfield, head of the local history department of Rush Rhees Library, was married to Herbert W. Andrews August 31.

1927
Paul E. Emerson, executive vice president of Monroe County Savings Bank, has been named a trustee of the bank.

1929
P. Austin Bleyler has been named manager of the new Taylor Instrument Co. plant in Asheville, N. C. He has been with the firm in Rochester since 1929.

1933
R. B. Hoffman, who has served as vice president of marketing for Gulf Oil Corporation in London for several years, will return to the general office in Pittsburgh as director of coordination for worldwide marketing.

1936
George J. Swarthout has been appointed assistant superintendent of electronic and steam generating at Rochester Gas and Electric Co.

1937
Otto E. Schaeper, Jr., formerly with Sanborn Company of Waltham, Massachusetts, has been named director of marketing research for Culver Advertising, Inc.

1938
Richard W. Dinsmore, vice president and general manager of Desilu Sales for the past two years, was featured in an article in the July Broadcasting magazine.

1940
Dr. Howard L. German, whose teaching background includes Athens College in Greece and Jahanzeb College in West Pakistan, has been appointed professor at East Carolina College.

1941
Glenn R. Lord has been appointed corporate vice president, marketing, by the Northrop Corp. in Beverly Hills.

1942
Dr. W. Frederick Staun, a member of the Ohio State faculty since 1936, has been named director of the university's Lakewood Academic Center.

1943
Mary Burdick Crandall has just returned to Rochester after living for six months in Hirakata, Japan, with her husband and three children.

1944
Mr. and Mrs. Richard N. Close announce the birth of their fourth child, Mary Schell, May 31. Close is director of the Apparatus Division of Airborne Instruments Lab, a division of Cutler-Hammer.

1945
Edward A. Mason, who lives with his wife and six children in Lexington, Mass., has been promoted to full professor at M.I.T.

1946
Thornton Hutchins has been awarded the diploma of a chartered life underwriter, one of the top professional designations in his field.

1947
Enildo Swanson Perry (U) has been appointed to teach science at Wayland (N. Y.) Central School this year.

1948
Bernice Boyarsky was married to Joseph Garibian in Rochester July 7.

1949
Dr. Robert Rosenthal has been named director of the cardiac catheterization unit at Albany Medical Center.

1950
John and Anne Corcoran Geer
announce the birth of their fourth son, Robert Alan, on March 19.

WILLIAM DONENHOFF, formerly vice president for marketing at Kordite Corp., has been appointed vice president and general manager for industrial products.

ROBERT J. LEHR (U) was married to Edith Manuel in Rochester June 8.

RICHARD CANVALL (U) has been appointed assistant professor of social studies at Niagara County Community College.

BILLY PULSIFER, assistant city editor and photo editor of Rochester Times Union, has been named head of the newly established graphic arts department for both the Times-Union and Democrat and Chronicle.

1951

ANGELO A. COSTANZA has been elected executive vice president of the Central Trust Company in Rochester.

The Rev. HARKLAND J. WEST is the new Protestant chaplain at Fredonia State University College. He was formerly associated with Brown's First Methodist Church in Rochester.

KEITH STOTT has been appointed librarian at Minoa (N. Y.) Free Library.

HELEN C. COLLINS was married to Dr. George C. Gallagher, acting director of the Alcoholic Rehabilitation Clinic in Washington, D. C., August 16. Mrs. Gallagher is studying for her master's degree at George Washington University.

1952

PAUL S. MILLER, formerly with Gimbel Brothers, has become store operations manager for the Philadelphia branch of S. Klein on the Square department store.

PHILIP K. FITZSIMMONS was married to Julie Anne Langie in Rochester September 10.

THEODORE A. FINE (U) has been promoted to assistant manager of the Central Trust Co. Ridge-Seneca Office in Rochester.

Alvin and Elizabeth Cockrell Minetree announce the birth of their fourth child, Gretchen May, on June 5.

ROBERT E. FRICKEY (U) '53G, has been promoted from office manager to head of the western division of Frederick Research Corp. of Tucson.

Dr. DONALD H. PAINTING has been appointed psychological consultant at Greenbook School, Glenmore, Pa., a private residential treatment center for boys.

Raymond B. Greene, '50, and PAULINA PASKOW announce the birth of their fifth child and third son, September 25.

D. Richard J. BARKER, member of the Montclair State College faculty since 1956, has been promoted to associate professor.

1953

LEONARD P. SKOLNICK of the University of Delaware faculty was married to Marjorie Sonnetag in New York City July 15.

1954

ANGELO G. FARAGI was married to Dolores Gaier of Rochester on June 22.

ELIZABETH D. TROXELL was married to Frank G. Matthews in Syracuse August 24.

ROGER LATHAN has been promoted to associate director of development at the UR to direct activities in corporation relations and fund raising.

DR. MALCOLM A. MOLINARI has accepted the position of associate director of housing and women's activities at Rochester Institute of Technology.

CLARK W. PERREY received a Ph.D. in chemistry at M.I.T. in June.

JOHN R. GRELLE was awarded a Ph.D. in theoretical physics at the University of California, Berkeley, in June, and is now doing research at Columbia University.

PETER B. BAILEY is assistant to the director of the computing center at Randolph-Macon College. He also holds first chair in the double bass section of the Richmond and Norfolk Symphonies.

THOMAS E. RICKERT, after completing a year's course at the Spanish Language Institute in San Jose, Costa Rica, is in charge of public relations for the Latin America Mission there. He and his wife have one child, Wayne Lawrence, born September 14.

BARRY WARSHAW and his wife, Helene, were awarded M.D. degrees from the Chicago Medical School in June. He is internning at Cook County Hospital in Chicago.

BRIAN A. CURTIS was awarded a Ph. D. at Rockefeller Institute in June and holds a post-doctoral fellowship from the National Science Foundation to study physiology at Duke University.

Births

TO EDWARD and SUSAN STORING MAYRECK, a son, Edward, July 14.

TO BERYL and JOAN ROSENTHAL NSURAUM, a second son, Mitchell Steven, June 24.

TO RONALD and CHERRY THOMSON SOCCARELLI, a second daughter, Amy, August 1.

Marriages

DENISE O'BRIEN to MERRIE J. BORDELL in Chittenango, N. Y., April 13.

LT. RUSSELL W. WARREN, JR., USN, to Carol Hyde in Gloversville, N. Y., July 6.

ROSS A. FERLITO to Malva B. HEISEcke of Buen Aires on July 12 in Mar- tinez.

1955

DR. LEE A. ELIOSEFF, assistant professor of English at the University of Texas, was married to Louise Jane Woodward of Dallas, June 21. Dr. Elioseff was awarded an American Council of Learned Societies fellowship for research and writing at Stanford University campus this fall.

DR. CHARLES T. FRUEHAN and DR. WILLARD B. OLMSTEAD, '57, received M.D. degrees at Albany Medical College of Union University at June commencement ceremonies. Fruehan is interning at the Albany Medical Center Hospital, and Olmstead at the Mary Fletcher Hospital, Burlington, Vt.

NATHAN ALDRICH ANDERSON and David Anderson, '57, announce the birth of their third child, a daughter, Valarie, August 4. Anderson teaches English at Eastridge High School, Rochester.

RICHARD J. HEIMER has been appointed chief optical designer at Fairchild Space and Defense Systems in Los Angeles.

Mr. and Mrs. WILLIAM C. BOWDEN announce the birth of their second child, Kurt William, on June 19.

BEVERLY G. ROBERTS, who received her master's degree at Rutgers last year, was awarded membership in Kappa Delta Pi, the national education honorary society in May. A teacher at Washington School, West Orange, N. J., she is soloist for the First Presbyterian Church of Orange and also sings with the Montclair Oratorio Club.

Births

May 20

MAY IN JANUARY

Few indeed are Rochester alumni who have not in some way come under the influence of Arthur J. May, popular history professor, tireless traveler on the alumni circuit of regional clubs, and, in recent years, every inch the distinguished University marshal at Commencement processions.

Professor May will retire in June. In his honor, the Alumni Federation will sponsor a dinner to be held on the River Campus on January 28. Invitations will be mailed to Rochester area alumni; alumni outside the area may make reservations by writing to Mrs. Hermine Teute in the Office of Alumni Relations.

come president of TFE Consultants, Inc., in Groversville, N. Y. He and his wife, Margaret Evans Scher, '57, have three sons.

Dr. Lee A. Elioseff, assistant professor of English at the University of Texas, was married to Louise Jane Woodward of Dallas, June 21. Dr. Elioseff was awarded an American Council of Learned Societies fellowship for research and writing at Stanford University campus this fall.

Dr. Charles T. Fruehan and Dr. Willard B. Olmstead, '57, received M.D. degrees at Albany Medical College of Union University at June commencement ceremonies. Fruehan is interning at the Albany Medical Center Hospital, and Olmstead at the Mary Fletcher Hospital, Burlington, Vt.

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Beverly G. Roberts, who received her master's degree at Rutgers last year, was awarded membership in Kappa Delta Pi, the national education honorary society in May. A teacher at Washington School, West Orange, N. J., she is soloist for the First Presbyterian Church of Orange and also sings with the Montclair Oratorio Club.

G. Russell West to Judith Tatum of Joplin, Mo., June 15.


Claude Buckley to Thomas McGurr in Tearneck, N. J., July 27.

Raphael G. Jacobs to Martha S. Goldstein in Herkiuner, N. Y., May 11.

David Fidelman, who received his D.D.S. in 1961 at the University of Pennsylvania, is now practicing dentistry in East Northport, N. Y.

Dr. Malcolm M. Molinaro has accepted the position of associate director of housing and women's activities at Rochester Institute of Technology.

Clark W. Perry received a Ph.D. in chemistry at M.I.T. in June.

John R. Grelle was awarded a Ph.D. in theoretical physics at the University of California, Berkeley, in June, and is now doing research at Columbia University.

Peter B. Bailey is assistant to the director of the computing center at Randolph-Macon College. He also holds first chair in the double bass section of the Richmond and Norfolk Symphonies.

Thomas E. Rickert, after completing a year's course at the Spanish Language Institute in San Jose, Costa Rica, is in charge of public relations for the Latin America Mission there. He and his wife have one child, Wayne Lawrence, born September 14.

Barry Warshaw and his wife, Helene, were awarded M.D. degrees from the Chicago Medical School in June. He is internning at Cook County Hospital in Chicago.

Brian A. Curtis was awarded a Ph.D. at Rockefeller Institute in June and holds a post-doctoral fellowship from the National Science Foundation to study physiology at Duke University.

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Marriages

Denise O'Brien to Mervie J. Bordell in Chittenango, N. Y., April 13.


Ross A. Ferlito to Malva B. Heisecke of Buen Aires on July 12 in Martinez.

Lawrence R. Palvino graduated from Albany School, receiving the Moot Court prize for excellence in appellate argument. He is now a member of Wiser, Shaw, Freeman, Ickes and Williams in Rochester.

Sanford Schneider has received an M.D. at New York University School of Medicine and will intern at Duke University Medical Center.

Henry P. George was awarded a Woodrow Wilson National Fellowship for study at Northwestern University.

G. Robert Withmer, Jr., who received his LL.B. last year at Harvard Law School, has joined the Rochester law firm of Nixon, Hargrave, Devons & Doyle.

Marriages

Barbara Merritt, formerly of the UR Admissions Office, to Oscar W. Roberts, student at Union Theological Seminary in New York City, July 13.

Dorothy Young to Roy H. Copeland, in Rochester June 22.

Dr. Kathleen Di Cicco to Gerald N. Bissell of Elizabeth, N. J., June 23 in New York City. Mr. Di Cicco is interning at Monmouth Medical Center.

Abigail Barnes to Charles R. Anderson in Rochester September 7.

Dr. Stuart and Kaplan to Judith Weinstein June 23 in Rochester.

Charles D. Fleischmann to
Mrs. Hirsch, who studied in Germany and in the United States, recently completed a course in the National Defense Language Fellowship Program. She is now teaching at the University of Maryland in Baltimore, N. Y., where she is working toward a Ph.D. degree.

Births

To Hugh and Patricia Hertel West, their fifth child, Douglas James, September 4.

To Leslie and Sally Goulding Kish, a son, Steven Andrew, August 12.


To Mr. and Mrs. Delmar and Susan Wiederhorn Copeland a son, Steven Matthew, September 7.

Graduates

Vincent Caravaglio, a teacher at Friars Academy, was selected as the outstanding graduate of the University of Pennsylvania's School of Music. He is now teaching at the New England Conservatory of Music in Boston.

Deaths

Mr. and Mrs. John J. Burton of New Rochelle, N. Y., have announced the death of their son, Joseph J. Burton, August 10.

Obituaries

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with husband and four children, to Cherry Hill, N. J.

**1947**

PHILIP M. SLATES, *48G, has joined the Jordan College of Music at Butler University as associate professor of theory. Slates, formerly with Peabody College, and his wife, Jean Stutzman Slates, *48E, oboist, have been active in Nashville musical enterprises for the past 12 years.

PAUL PARMELEE, associate professor at the University of Colorado, performed at the opening fall concert there.

Dr. William H. PRESSER (G) received a 1963 Roth Orchestra Composition Contract Commission of the Chicago Symphony. Dr. Presser is associate professor of music at University of Southern Mississippi.

IRIS BEDRICK ROGERS, *48, choir director and soprano soloist at Temple Beth El, Closter, N. J., was featured artist at the Grand Opera Foundation of New Jersey concert in New York City in mid-June.

**1948**

JOSEPH TARPLEY (G) has been named acting dean of the University of Miami School of Music.

Jack W. DOOLITTLE has been appointed high school principal of the Oxford (N. Y.) School System.

Dr. W. Parks GRANT (G) received a composition fellowship at the Huntington Hartford Foundation, Pacific Palisades, California, last summer.

**1949**

Grace Olesen Norris has recently been starring in a touring company of "Finnian's Rainbow." She frequently shares theatrical honors with her 9-year old daughter, Christopher, and her husband Arthur, a musical conductor.

**1951**

ELMER C. BONAZZI was married to Jerome A. CARRINGTON, *58E, in Marlton, N. Y., September 21. Carrington is a petroleum engineer with Socony Mobil Oil Co. in New York City.

CLIFFORD SNYDER has been appointed to the staff of the vocal department at the Nassau Conservatory of Music.


**1952**

SAL MARTIANO (G), whose composition, "O, O, O, O, That Shakespererian Rag," was recently released by Composers Recordings, Inc., is visiting composer at the University of Illinois.

WILLIAM PREULIC (G), of the University of Iowa music faculty, was viola soloist for the August 21st Peninsula Music Festival at Fish Creek, Wis.

MARGARET VAN RINGELSTEYN MOTTER, violinist, is co-director of the choir at Miami's First Unitarian Church and member of the University of Miami Symphony in Florida.

GEORGE CLARENCE GREENE, JR., *53G, assistant professor of violin and theory at the University of Vermont, has been named to the staff of the Hoff-Barthelson Music School, Greenwich, N. Y.

**1953**

KENNETH A. WENDRICH *53G, conducted the Olde Fashioned Concerts-in-the-Park at Old Greenwich, Conn., this summer. Wendrich is director of instrumental music for the Greenwich High School Band and Orchestra and music director and conductor of the Greenwich Philharmonics.

Byrne OWEN, whose compositions were performed at several Walla Walla College functions last spring, was guest profes-
sor at Andrews University during the summer. Her "Black Key Jig" and "Ring Dance" have been published.

GRETEL SHANLEY, *55G, graduate student in social welfare at the University of California at Los Angeles, was soloist and first flutist with the Brit Mil Music Festival near Medford, Ore., in August. She also performs with the Westwood Wind Quintet, the Amati Chamber Players, and the Temptika Chamber Symphony. She gave the U. S. premiere performance of a solo work by Ernst Krenek in Los Angeles early this year.

Dr. and Mrs. BENJAMIN DUNFORD (G), of Nashville, recently added new members of the fine arts faculty of William Carey College at Hattiesburg, Miss.

**1954**

KENNETH E. ALFORD (G) has been appointed head of the Ranger Junior College music department.

**1956**

DR. ELMWOOD SMITH, *57G, who recently received a doctoral degree in opera conducting at Indiana University, has begun a year's study at the Academy of Music in Berlin under a Fulbright grant.

JAMES BASTA holds the first horn chair in the United States marine band.

**1957**

ANN HEHEREKIN, *58G, presented a piano recital at the Peninsula Valley (N. Y.) Central School in late July.

Herbert and LOUANNE LARSON LIND announce the birth of a son, Todd Nelson, September 8.

SALLY COOMBS (G) was married to Harry M. Kaneshige in Wooster, Ohio, August 22. Mrs. Kaneshige is assistant professor of music at Ohio University, and is a member of the BSO concert and of the Charleston (W. Va.) Symphony.

DAVID GILBERT, *58G, is flutist in the Ars Nova Trio formed in 1961. The group was featured in the Music Journal Anthology of 1963.

THOMAS B. BRICCIETTI, composer-conductor, has been appointed musical director of the newly formed St. Petersburg (Fla.) Philharmonic Society. He is also director of the Pinellas County Youth Symphony.

**1958**

MARCIA KAY LOEFFLER, instructor of organ and piano at Rollins College, will present a piano recital in Winter Park, Fla., March 11.

ELSA LUDWIG (G), teacher of clarinet at Michigan State University and principal clarinetist of the Lansing Symphony, is a member of the faculty woodwind quintet. She performed with the Lake Placid Festival Trio in August.

LEE DOUGHERTY PAGANO, *59G, winner of the 1963 Young Artists Auditions, sang at the White House September 6, and made her New York debut in Town Hall October 19.

RICHARD C. EINSEL has been named director of music and organist at First Presbyterian Church in Muncie, Ind.

**1959**

EUGENIA TOOLE (G), organist for the Congregational Church of Manhaset, N. Y., has been named one of the four patrons of Phi Beta of the New York area.

ROBERT VEHAR (G) has been appointed assistant professor of music at State University of New York in Cobleskill.

MARTIN SHAFER (G), *61G, viololist, has been appointed associate professor of music at the Conservatory of Music of the University of Missouri in Kansas City.

**1960**

SARA ROTH FINKEL and Dr. Arnold Finkel, *59, announce the birth of a son, David Adam, September 16. Dr. Finkel is internering at Letterman Army Hospital, Calif.

NOLITA MARCAJ has been named director of the music department of the University of Vermont, received a master of music degree at Indiana University last year.

RALPH W. MONTGOMERY was married to Mitzi Herron in Denton, Texas, May 11. He is a member of the University of Kansas faculty.

ROBERT L. TOWN who won the spring Young Artists Composition sponsored by the Boston Chapter of the American Guild of Organists and the Boston Symphony Orchestra, is now studying for his doctorate at the University of Michigan.

RICHARD L. STEFF (G) has been named assistant professor of music and director of the Jazz Ensemble at Northeast Louisiana State College.

DAVID RICKET, trombonist, and his wife, a violinist, both with the Indianapolis Symphony, performed with the New Hampshire Music Festival Orchestra recently.

**1961**

MARGARET BATTLE BROOKE was married to Peter D. Waldstein, chemist with the Atomic Energy Commission, on July 12 in Westfield, N. J.

DAVID R. BOSSARD was married to Marcia Fanev in Norwich, Conn., June 29.

GARE FURMAN COFFEE, who completed requirements for a master's degree with a flute recital at Boston University, July 29, is teacher of music in the Norwood Schools near Boston.

JOAN HARTER, member of the Houston Symphony and student at the University of Houston, offered a violin recital at Spokane, Wash., July 22, while on the summer music faculty at Eastern Washington State College.

SUZAN THOMAS was married to Donald G. Stewart of Sterling, Ill., June 12 in Rochester.

ELSA GILDAY was married to John E. McMahon, Jr., in Waterloo, N. Y., August 10.

JAMES ORE (G), instructor of brass instruments at Augustana College and principal trumpet of the Sioux Falls Symphony and Municipal Band, performed as soloist for 18 of the season's park concerts.

**1962**

BOBBIE MURDOVER, who received a Fulbright-Hays grant to study with the Rome Opera Company for a year, recently sang at the Chicagoig Music Festival Luncheon as one of the top winners in the annual festival contest.

PERRY MARTIN is vocal teacher at the Anne Hutchinson School in Eastchester, N. Y.

Marriages

CONSTANCE KNOX (G) was married to Frank M. Carroll, *60G, August 17 in Tucson. They will live in Salisgburg, Md.

RONALD L. GAHART was married to Carol Barefield in Colorado Springs August 24.

**1963**

PEXELLOPE BALL is studying piano with Dr. Kurt Neumuller in Salzburg.

SANDRA GEDZIS, a member of the Amarillo Symphony, is a teacher of instruments in Amarillo.

DR. ROBERTA SEXTON GARY (G) has been appointed director of music at St. Paul's Lutheran Church in Syracuse.
DEPARTMENT OF NURSING

Dr. James D. Bramer recently celebrated his 25th anniversary as a practicing physician in Palmry, N. Y. For the past 20 years he has served as Medical Health Officer there, and for the past seven years, he has also been company physician for Garlock Inc.

Dr. Elijah Adams, former head of the department of pharmacology at St. Louis University School of Medicine, has been appointed professor and head of the department of biochemistry at the University of Maryland School of Medicine.

Dr. Jacob Koomen, Jr., '39, assistant health director of the North Carolina State Board of Health, was a featured speaker at the annual medical symposium of the Wake County Chapter of the American Academy of General Practice, September 17.

Dr. Donald E. Gregg, '29G, '30G, has been selected by the American Heart Association to receive its 1963 Research Achievement Award for outstanding accomplishment in the field of heart and blood vessel diseases. Dr. Gregg is chief of the department of cardiorespiratory diseases at Walter Reed Army Institute of Research in Washington.

Dr. William L. Parry, '45, professor and head of the department of urology at the University of Oklahoma School of Medicine, has been named first chief of staff of Oklahoma City University Hospitals.

Dr. William C. McCormack, Ames, Iowa, pediatrician, has been appointed a collaborator on the staff of the College of Veterinary Medicine of Iowa State University.

Dr. A. Kurt Weiss was recently awarded a citation for service by the American Association of Retired Persons and the National Retired Teachers Association.

Dr. George R. Morrison, '48, has been promoted to assistant professor in the School of Medicine at Washington University.

Dr. Robert O. Jensen is practicing general surgery in Penn Yan, N. Y., where he is on the staff of Soldiers and Sailors Memorial Hospital. He will continue as assistant clinical professor at Syracuse University, part-time.

1935
1956
Dr. Joseph A. Leistyna has completed a clinical and research fellowship in pediatric endocrinology at Ohio State University's Children's Hospital and has joined Dr. John Macaulay in the practice of pediatrics in Oneida, N. Y.

Dr. Charles F. Merwin, who completed residency in radiology in the Mayo Foundation last June, received the degree of master of science in dermatology from the University of Minnesota, August 22.

Dr. Alice F. Fishbein, specialist in internal medicine, has joined the Frederick C. Smith Clinic, Marion, Ohio.

Dr. Dominic J. Scaramuzzino, having completed two years of service with the U. S. Air Force, has opened an office in Geneva, N. Y.

Dr. William A. Mast, resident orthopedic surgeon at University Hospital in Cleveland, received top score in the state medical board examination in August, leading 309 other physicians.

Dr. David V. Clough, formerly a captain in the Air Force in Bangor, Maine, has opened a general practice in Glovesville, N. Y.

Dr. Thomas C. Hollocher, Jr., professor in the graduate school of the Brandeis University biochemistry center, has recently been awarded a $65,000 research grant.

Dr. Laurence A. Savett was married to Susanne Gotlieb, a medical social worker in St. Paul, March 30. Dr. Savett is a resident in internal medicine at Metropolitan General Hospital in Cleveland.

Dr. William Crawford, who completed a year's internship at the Mary Hitchcock Memorial Hospital, will serve as a resident in general surgery under the Dartmouth Affiliated Hospital Program at both Mary Hitchcock Memorial Hospital and the White River Junction (N. H.) Veterans' Administration Hospital.

Dr. Gilbert W. Levitt was married to Minna M. Katz in Seattle, July 7. Dr. Levitt is a U. S. army captain serving at Madigan Hospital there.

Captain John A. Armer, USAF, has left for South Viet Nam where he has been assigned to active duty for a year.

Dr. and Mrs. Paul H. Frickey announce the birth of a son, Darryl Paul, on July 16. They reside in Montvale, N. J.

Dr. and Mrs. Paul H. Frickey announce the birth of their first child, Thomas Ross, on August 27.

Dr. STANLEY J. SHEPHERD, '43E, accomplished violinist and medical doctor, died September 10 in Colorado Springs.

MEATH announce the birth of a son, David Gregory, August 14.

Ann Elizabeth Hall, assistant instructor in medical and surgical nursing at the University City of Baltimore, recently returned from a trip to Europe, where she visited and reported on some of the hospitals of Stockholm.

Catherine L. Rogers received the degree of master of science at the University of Colorado in June.

Janice Van Denburg was married to Dr. Arthur Keitz, '63, in North Tonawanda, N. Y., June 15.

Judith Harbour was married to Carl E. Primavera, '61, in Rochester, June 15.

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