

## SURGICAL HORIZONS\*

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Our homes are 10,000 miles apart, but the problems that occupy our waking hours are very much the same. We at Minnesota have long felt an affinity for South Africa. For, besides the several fine young men who have come to work with us at the University of Minnesota, many have come as visitors to enrich us with their experiences and their friendship, among others, Professors Louw, Du Plessis, and Chapman. A visitor here cannot escape feeling that the future holds out tremendous promise and potential for medicine in South Africa.

Perhaps it was no accident that the pioneer, Van Riebeeck, was a ship's surgeon, for exploration and medicine have often gone hand in hand. All who have read accounts of the famed explorer and doctor, David Livingstone, have experienced a flush of excitement, and I am thrilled to stand now near the spot from which Livingstone began his trek into the interior. He is said to have particularly admired the beautiful country around Algoa Bay.<sup>1</sup> His writings are full of observations on tropical diseases and therapy and show throughout the insatiable curiosity of a scientist. Livingstone wrote: 'See if you meet a man who measured the Cape elephant . . . Are ostriches monogamists or polygamists? . . . Try and count their paces with your watch when at full speed and measure the length of his stride . . . Any information as to the cause of the migration of springbucks, wildebeests, the time, numbers . . .'<sup>2</sup> These enquiries are reminiscent of those of John Hunter or Edward Jenner.

There are no areas of confidential information in medicine. An important discovery made on one continent is reported by medical journals everywhere and becomes quickly the property of all the peoples of the world. Our late President, John F. Kennedy, spoke of this international aspect of science in addressing the Centenary of the National Academy of Science just a month before his tragic death in 1963. 'The great scientific challenges,' he said, 'transcend national frontiers and national prejudices . . . The language of science has always been universal . . . but the contemporary revolution in transport and communications has dramatically contributed to the internationalization of science . . . and the increase in organized international cooperation.'<sup>3</sup>

Physicians everywhere realize that the marvels of modern-day communications have shrunk the globe considerably. The universal language of international medicine and humanitarianism is the one common tongue that can cross international boundaries freely. It is the language spoken by every physician, from every continent, every creed, and every nationality; it carries the universal solvent of sympathy which can penetrate barriers and cross thresholds closed to many. International medicine is a powerful force for truth, compassion, understanding, human service, and lasting peace.

\*Based on the opening address at the Congress of the Association of Surgeons of South Africa (M.A.S.A.), held in Port Elizabeth in July 1964.

In my contact with surgeons and other members of the medical profession from many countries of the world, I am convinced that medicine, more than any other activity or discipline, makes the whole world kin. When the quality of sympathy and community of feeling, at the basis of all good medicine, enter more freely into all human enterprises, the problems of food and shelter for all and of education for our children will loom less formidable and unremediable than they now appear in most parts of the world. Society and medicine together are working unrelentingly to set aside the dictum of natural selection by the survival of the fittest.

Society no longer is content to leave the straggler and the handicapped to their own fate. With medicine as a strong ally, a large proportion of such persons today can be salvaged for a life of usefulness and personal fulfilment. Much of the labour of orthopaedic surgeons since World War I has dealt with freeing children from the handicaps and bondage of osseous deformities and the crippling effects of poliomyelitis. Today cardiac surgeons here and elsewhere are bringing the promise of long and active life to children with congenital heart deformities.

The prevention of such deformities promises to be an important new field of investigative adventure. It is known that when pregnant rats are deprived of certain food moieties, deformities are more likely to occur. When the significance of such deficiencies is better understood, many congenital abnormalities will probably be avoided by the combined efforts of the nutritionist and geneticist. Medical advance will continue to enable many to survive who would ordinarily be doomed by the law of natural selection.

*War, Pestilence and Disease*

Throughout the ages, war and pestilence have been the chief levellers of population growth. Medicine and society have succeeded in eliminating many of the plagues which, through the centuries, have decimated peoples in all areas of the world; yet struggles for advantage continue unabated.

The final lessons of most wars have been their utter futility. There were 8 million battle casualties in World War I; 10 million in World War II; in addition, approximately 15,000,000 civilians were killed by massacre, starvation, ill-treatment, disease and bombing.<sup>4</sup> Approximately two-thirds of the 9.5 million Jews in Europe were annihilated, an outrage to the dignity and humanity of man which must plague the conscience of all for centuries to come.<sup>5</sup> The horror and holocaust of war should persuade peoples everywhere to learn to resolve their differences, with advantages for all. The passion of resentment, if constantly rekindled, only consumes. If all man's efforts were directed at improving our common lot, what a different place this world could be!

*Demographic Studies*

The *Demographic Yearbook of the United Nations* for 1962 indicates that for certain segments of the South



African population, it is safer to live in South Africa than in the United States. In the United States, a mortality of 929.6 per 100,000 of the population is reported; for those of European origin living in South Africa, this same figure is 869.5. Whether a disparity in the over-all age of the population enters into the greater health of this country is not apparent. If the mortalities of a similar age group, that of congenital deformities and diseases of infancy, are examined, a very modest accomplishment for both geographic areas is noticed, with a small edge for the United States—a mortality of 48.8 per 100,000 infants as contrasted with a figure of 55.4 for your country.<sup>6</sup> In future years important and telling work will most certainly be done to better this account.

At the turn of the century, pneumonia and tuberculosis were reported as the first and second causes of death in the USA.<sup>7</sup> Tuberculosis is no longer a serious threat in either of our countries, though it still constitutes a menace to certain segments of our respective populations.

The next decade will probably find most infectious diseases well under control almost universally. Immunization against poliomyelitis will probably make that disease as rare as are smallpox and typhoid fever in many countries of the world. Death benefits paid out for poliomyelitis last year by one of the largest life insurance companies were only \$7,000, about 1 per cent of the 1953 outlay (\$658,000).<sup>8</sup>

#### RESEARCH

Since World War II people everywhere have become deeply interested in many facets of research and their social implications. In consequence medicine is dealing with a continuously better informed public, who is as anxious to know that research is liberally supported as it is to learn the fruits of research.

Several years ago a visitor to my office was persuaded to contribute \$100,000 to our research funds, which over the years has now grown to \$300,000. About 10 days after the first gift, however, my generous donor called to inquire, 'Well, what have you discovered?' As all learn, who work hard at this game (including benefactors), the fruits of research are not plucked that soon.

Today the 4 great cripplers that take the largest toll of life are: (1) diseases of the heart and blood vessels, (2) cancer, (3) trauma, and (4) congenital deformities.<sup>9</sup> Medicine, like science, has an expanding horizon. In anticipating what can be achieved against the 4 great cripplers we will tend to star-gaze, but a look into the past will assist our orientation.

The most notable contributions of surgery to the welfare of man are anaesthesia and asepsis. The first public demonstration of the use of ether was made in Boston on 16 October 1846. A young Bostonian studying medicine in Paris remarked shortly after news of the event, that Paris surgeons and the French public had embraced anaesthesia as though they had always had it. Probably no innovation in the field of medicine has been accepted so readily as anaesthesia.

In the summer of 1865, Lister, having learned of the work of Pasteur through a colleague in chemistry at Glasgow, began his observations with a carbolic acid

dressings for compound fractures. At that time the likelihood of death from such fractures, when a large bone protruded through the skin, was about 50%. Such an accident usually indicated alerting a priest or parson as well as a surgeon. When Lister first described his results in 1867, he was able to report 11 successive recoveries from compound fractures.<sup>10</sup> By the time Lister ended in 1912, all opposition to antisepsis and asepsis had died. However, throughout his active professional life, persons of the stamp of the famed gynaecologist, Lawson Tait, of Birmingham, England, challenged Lister's discovery as being without merit, contending that simple cleanliness was at least as effective as the antiseptic system.

When Lister spoke in Philadelphia in 1876, commemorating the centenary of our Declaration of Independence, Lister's proposals were received with only suggestions of approval. Five years later, our President, James Garfield, died from a pistol shot in the back, essentially because his surgeons failed to follow the precepts which Lister had described. The rising science of bacteriology soon clarified matters. When Koch announced in London in 1881 that bacteria could be grown and identified in cultures, Pasteur remarked: 'It is a great advance'.<sup>11</sup>

Progress usually follows this trend; it is not orderly as it should be. As missing pieces of information are uncovered and fitted into scientific picture puzzles, the nature of discovery comes to have greater meaning for us. In retrospect, it is easy to point to suggestions on the horizon which, if implemented, would have brought antiseptic surgery into being many years sooner (Table I).

The most exciting development in surgery during the current era has been in treatment of heart disease, once solely the domain of the physician. Courageous and aggressive cardiac surgeons are now repairing a large number of the congenital defects of the heart with mortalities no greater than those besetting operations dealing with more prosaic lesions. Heart valves are being replaced with significant success. Imaginative surgeons are looking to devices such as an artificial heart in the way of a pump and small reservoirs that will do what the heart now does for us without any effort on our part, while other surgeons have built hyperbaric oxygen chambers to lessen the need for an extracorporeal circulation during cardiac by-pass.

Norman Shumway, a former Minnesotan, now at Stanford University in California, has removed the dog's heart, meanwhile sustaining the circulation to vital areas by perfusion. After the heart is stitched back in place, some of the dogs continue to retain normal cardiac function for more than 2 years later. This suggests that the function of extrinsic cardiac nerves too can be taken over by the intrinsic nerve plexuses to regulate heart action.<sup>12</sup>

Surgeons at the University of Minnesota, under the able leadership of my colleague, C. Walton Lillehei—who together with his pupils has contributed so much to the development of cardiac surgery—initiated studies to provide an electrical source for the heartbeat with pacemakers which today are implanted under the skin. These surgeons are now working experimentally toward control of blood pressure by such means. Perhaps we will soon see such



TABLE I. EVOLUTION OF ANTISEPTIC TREATMENT OF WOUNDS

	<i>Date of Publication</i>	<i>Wound management or suggestions of wound treatment</i>
1. Hippocrates (460 - 370 B.C.) Father of Medicine	Hippocratic writings (400 - 360 B.C.)	Wine or wine and oil
2. St. Luke 1st century A.D. physician-philosopher	Before 70 A.D.	Oil and wine
3. Theodoric (1205 - 1296) surgeon	1265 - 75	Wine and bandages
4. H. Mondeville (1260 - 1320) surgeon	1306 - 12	Do not probe; wash and dress with wine
5. Chauliac (1300 - 68) surgeon	1363	Active treatment, not Nature, responsible for wound healing
6. John Pringle (1707 - 1782) sanitarian	1750	Coined word antiseptic; found myrrh and alum each 30 times as antiseptic as sea water
7. Abbé Spallanzani (1729 - 99) physiologist-philosopher	1765	Refuted Needham's (1748) thesis of spontaneous generation
8. J. M. Delpuch (1777 - 1832) surgeon	1816	Subcutaneous tenotomy on Achilles tendon
9. G. F. L. Stromeyer (1804 - 76) surgeon	1831	Subcutaneous surgery
10. O. W. Holmes (1809 - 94) medical philosopher	1843	Contagion of puerperal fever carried by physicians and midwives
11. Semmelweiss (1816 - 1865) obstetrician	1847	Advocated washing hands with calcium chloride
12. A. N. Bell (1820 - 1911) sanitarian	1848	Live steam for disinfection of naval ship <i>Vixen</i>
13. Elisha Harris (1824 - 1884)	1856	Steam sterilization and boiling of hospital linen in Quarantine Hospital, New York
14. Florence Nightingale (1823 - 1910) sanitarian and hospital reformer	1860	Nurses to wash hands with hot water and soap; live steam to clean bed linen at Haslar Naval Hospital since 1859
15. A. Pritchard surgeon	1860	Strong alcohol prevents suppuration and favours wound healing by first intention
16. Louis Pasteur (1822 - 1878)	1861	Proved germs cause 'spontaneous' generation, confuting contentions of Liebig and Pouchet
17. Jules Lemaire (b. 1814) chemist-surgeon	1860	Coal tar dressing for wounds.
	1863	Phenic acid for suppurating wounds
18. Joseph Lister (1829 - 1912) surgeon	1865	Carbolic acid dressing for wounds.
	1867	5% carbolic acid spray

devices to energize respiration, to control motion in paralysed extremities, to take over the functions of the liver. If and when we learn to prevent rheumatic heart disease and congenital deformities, the cardiac surgeons will channel more effort into removing obstructions from the coronary arteries.

The Psalmist tells us that the years of man are 'three-score and ten' and 'if by reason of strength they be four-score years, yet is their strength labour and sorrow'. My own experience with surgical problems of these elderly

patients suggests very definitely that most, if not all, have a keen desire to live as long as the environmental weather and company are reasonably acceptable. One of the great accomplishments of surgeons during the past decade has been replacement of worn-out arteries, especially the larger vessels. If similar progress can be made with small arteries, such as those occluded by sclerotic processes in the heart, brain, and lower extremities, longer and better life can be offered. The great progress of modern day technology may suggest that man has finally succeeded in eating from the Tree of Life, and now threatens to live forever. However, unless endocrinology can thwart some of the infirmities of increasing years, it appears likely that the prophecy of Genesis will continue to hold. While struggling to make men live longer, a primary purpose of medicine must continue to be to make life as full and happy for the recipient as possible.

Thirty years ago, the late Earl Padgett of Kansas demonstrated that skin survives when transplanted from one identical twin to another.<sup>13</sup> Many years were to intervene before a Harvard group of clinicians re-entered the field by transferring a kidney successfully from one identical twin to the other.<sup>14</sup> Several hundred such operations have since been done throughout the world, saving the lives of many patients dying of uraemia. In many instances, the donor has not even been a relative, but some kind Samaritan, willing to sacrifice an organ in order that another might live. Today, in our country, burns take more lives than do all infectious diseases. What a wonderful thing it will be when skin can be transferred as successfully between unrelated persons as is now possible between identical twins. In almost every clinic in the United States, immunologists, pharmacologists, and surgeons are pushing forward with the problems of tissue transplantation, working feverishly to thwart the immune reaction which threatens the viability of tissues derived from other individuals, hoping thereby to achieve transplantation of many organs.

#### Cancer

Cancer will probably continue to be a dread killer as long as we are ignorant of its causes. In an address in 1897, W. W. Keen, a well-known American surgeon, regretted that he would not be alive in 1947, for the passage of 50 years would certainly see the conquest of cancer.<sup>15</sup> The late King George V was a far better prophet. In addressing the First International Cancer Conference in 1928, the King said: 'I note with interest that your object is research, both into the cure and causes of cancer. No doubt in the last resort the discovery of the cause is the only certain and absolute means of cure. But I am glad that you have not ignored the practical side of the problem. Remembering the thousands of sufferers from cancer, I feel that if your discussions lead to advance in diagnosis, treatment, or even palliation of the disease, this Conference will have justified itself and earned the gratitude of mankind.'<sup>16</sup>

Slow and discouraging as the pace has been, some progress is being made. Gastric cancer is on the decline, for reasons that still remain obscure, but seem to suggest an environmental influence. This should be helpful in spurting investigation of likely causes. As long ago as 1775,



Pott identified soot as the likely cause of scrotal cancer in chimney sweeps.<sup>17</sup> In 1924, Kennaway identified the carcinogenic agent in soot and tar as dibenzanthracene.<sup>18</sup> The significant role of inhalation of oils and tar of tobacco in cigarette smoking appears to be well established, and current studies should have an influence on lung cancer, which has come to be one of the important causes of death from cancer. The relationship of sunlight to skin cancer is, of course, well known, and preventive measures influence favourably the hazards of this frequent cancer. The work of Papanicolaou in detecting early cancer of the cervix in women has already reflected gains as an informed public responds to the need for early diagnosis.

The results of our own Cancer Detection Centre at the University of Minnesota suggest that perhaps the best way currently to attack the problem of breast cancer is through breast cancer detection clinics, to which women may report annually for examinations by experienced examiners. Our experience indicates that surgery performed for breast cancer at this early stage is attended by greatly improved survival rate. At our centre annual proctoscopic examinations of men and women are made in which any observed polyps of the rectum are fulgurated or excised. Study of this relationship has prompted my colleague, Dr. Victor Gilbertsen, to ask: 'Is not cancer of the rectum a preventable disease?'<sup>19</sup> Apparently, until effective suppressive agents are available to thwart the aggressive invasiveness of cancer cells, early diagnosis in the symptomless phase affords the best promise of cure from cancer today.

#### FUTURE

Ideas originating in creative minds carried on the wings of imagination, and explored by talented men of unswerving purpose and dedication from many disciplines, braced by adequate financial backing and with some assistance from 'Lady Luck' will certainly lift some of these items from the wishing well to hopeful reality in the foreseeable future.

Chemistry, physics and engineering are broadening and strengthening the basic structure of medicine. Multiple telemetric recording devices and instruments of precision now in use in experimental laboratories and in the operating theatres of cardiac surgeons reflect startling developments in the electronic instrumentation field. In clinical laboratories, automation devices are replacing much labour in the staining of slides for histologic study and in performing many chemical tests simultaneously on a large number of specimens.

Infection and haemorrhage are still the bane of the surgeon's existence and constitute the primary sources of postoperative morbidity and mortality. If all infection could be controlled or eliminated, it would be a great boon for surgery. Simple precision techniques providing perfect haemostasis at operation are every surgeon's dream. And to such musings certainly all surgeons would interject a plea for effective agents to accelerate wound healing. And if stimulants encouraging tissue regeneration are uncovered, the antithesis, affording protection against overfunction of tissues or organs will also most certainly come about. Insulin, vitamin B<sub>12</sub> and cortisone, miracles of our age, are forms of substitution therapy. Antithetical counterparts or suppressives of organ function in the form of specific pharmacologic inhibitors to control peptic ulcer, hyperfunction of the hypophysis and parathyroid glands will certainly be available at some future date. Within a decade, we may have inviting palatable synthetic foods which may make it unnecessary to pass grass and fodder through a cow to provide meat or milk. Mechanized farming has virtually eliminated the work horse on American farms. Factories may well come to supplant farms for the production of foods which now nourish animals which today supply most of the food reaching our tables. Development of techniques of

harvesting fish more economically from our oceans and seas also will provide an abundance of food for a burgeoning world population.

Water, land, people, soil and productivity are interlocking questions of the greatest interest to us all. The time will undoubtedly come when salt can be removed economically from sea water, making it drinkable and practical for irrigation. Then many a desert will bloom. Those who have had the opportunity of visiting Israel can confirm what water and land put to effective use can do.

Whether science will be able to help control weather, only future research will tell. Heating, ventilation, and air-conditioning have made it possible to live in warm and cold climates. We Minnesotans are able to withstand temperature variations of more than 130°F, the thermometer fluctuating in many a year between 100°F in summer to -40° in winter. The human body, obviously, has unusual ability to accommodate to great differences of temperature. However, we are quite dependent upon technical developments to make such disparities tolerable. Rain and the impenetrability of fog, so disturbing and treacherous for aviators, will certainly come under better control. How man shall be transported in the year 2000 is anybody's guess. Certainly restrictive measures need to be invoked to curb the alarming slaughter on our highways today.

With the control of infectious diseases almost in sight, the need to accelerate global studies of population control is becoming increasingly evident. At the present rate of growth, the United States is doubling its population every 40 years, and by the year 2000, will be a country of 350,000,000 people.<sup>20</sup> A few areas in the world are doubling population at considerably shorter intervals. Despite our increased capacity to produce food, the time will most certainly come when the world will be overpopulated unless interplanetary travel opens up new avenues for colonization or export.

The physician mindful of the role of alcohol in cirrhosis, of caffeine and alcohol in peptic ulcer, of smoking in coronary disease, emphysema and lung cancer; of dietary indiscretions in obesity, diabetes, and atherosclerosis, has come to represent the spectre of a new puritanical asceticism threatening to separate us from enjoyment of our personal vices. Some ask, 'What new day-brighteners can I look forward to now? Or must life always be an uninterrupted Spartan existence?'

The Old Testament implies a strong mandate for a 6-day working week. Today with every third day of the year a holiday, increased leisure has become a problem with significant social implications. The boy who grew up on a farm in my day and had cows to milk morning and evening scarcely knew what a leisure day was. He learned the value of work and consecutiveness so helpful in life's journey. Leisure implemented for betterment of the individual and society could lend an awakened and sustained zest to youth for more purposeful lives, the impact of which could be felt in future times and generations.

The way of research is long and tortuous, but as long as the investigator is not impeded by irresolution or indolence nor immobilized by frustrations or discouragement, his search will turn up useful information. Such, after all, is the final test of knowledge, even though it may have serendipitous overtones unlike those the scientific Don Quixote expected to find.

Ideas and knowledge are still the most underdeveloped areas in the world. The studies of Dr. William Beaumont, a young American army surgeon who revolutionized the concepts of human digestion, are still a rich source of inspiration and instruction to gastroenterologists and physiologists and others interested in the story of digestion. Stationed at a remote outpost in the American wilderness at the turn of the last century, Dr. Beaumont was called to treat a French-Indian *voyageur* who had been wounded by a gunshot in the abdomen. The patient recovered, but when his wound healed, the stomach remained open to the exterior. Dr. Beaumont realized he had an excellent subject for the study of gastric juice and digestion. The conspicuous success of Beaumont's work carried out in primitive laboratories in Army huts and stations across the American Northwest upon his human guinea-pig, Alexis St. Martin, who more than once deserted to join his own people, is a striking example of the triumph of a determined investigator over obstacles. Beaumont's deduc-



tions and his carefully annotated studies are a model for scientists today.<sup>21</sup> Beaumont's accomplishments serve to remind us that the determination, dedication and perseverance of the investigator can triumph over difficulties.

As I continue to speak of universities and the training of future surgeons, this picture will, I hope, linger in memory. Beaumont's accomplishment serves to remind us that it is the individuals, even more than institutions, who determine our scientific advances. Great laboratories must continue to be energized by men with creative ideas who recognize and seize opportunities.

#### Support of Research

During my *wanderjahr* on the European Continent almost 40 years ago, I remember well my visit to the Kaiser-Wilhelm Research Institute, just outside Berlin. Like a penniless little boy looking through a bakery window at delectables, I could only wish we would some day be fortunate enough to have in our country a research institute of this quality and magnitude. World War II succeeded very definitely in persuading our government, as well as our people, that research in all areas, including medicine, pays off handsomely. Current annual appropriations by our Congress for medical research are in the area of \$800,000,000.

Minnesota's world-famous surgeon, William Mayo, was many years a Regent of the University of Minnesota. During the depression years (1930-1939) he persuaded the Legislature to provide the University's Medical School with an annual budget of \$50,000 for research. To us at the time it was like manna from heaven, though more than 50 individuals shared in partition of the money. Today, in my department alone, several investigators receive more than \$100,000 each for support of their own research. The largesse of our government has been magnificent, but in the end it is the great interest, faith, and confidence of the public in research that makes all this possible.

In certain circles it said today that there is too much research: 'Give the medical school back to the students', 'researchers are a dime a dozen'. These philosophies, however well intended, distort the situation badly. The contrary is certainly true. Only in an atmosphere of advancing knowledge, is the student stimulated to do his very best. 'Research, research, and more research' is the stirring admonition of a wise clinician, Paul Dudley White, known to physicians everywhere.<sup>22</sup> Only better sources of light can illuminate unsolved problems to make them intelligible to us.

#### Education

Medicine and medical education, like the world itself, are in a constant state of flux. The surgeon of 30 years ago practised his art with knowledge of half a dozen drugs. Each year new drugs are becoming available by the hundreds, many of which lend promise of controlling a number of diseases previously non-responsive to treatment. Nowadays we need a ready handbook to guide us in selection of appropriate drugs. Much of the physician's work today has resulted from the spawning revolution in pharmacology. Presently, departments of clinical pharmacology will come into being in our medical schools. Better anaesthetics, antiseptics and agents for the control of bacterial and other diseases, as well as of disturbed organ functions, may reasonably be expected. An extended period of exposure to unsettled problems in the experimental laboratory provides an excellent and probably the best training ground for surgeons, and for those climbing the academic ladder additional time spent in another discipline, e.g. physiology, biochemistry, microbiology, or biophysics, is definitely in order.

Before the advent of the cinema, radio, and television, the pupil of the elementary school was usually home in the evenings, hovering about a table in the family parlour near a small central source of light. Whatever defect the arrangement provided, it did afford the opportunity for the youngster to acquire a love of reading, emphasized by Anthony Trollope, in a delightful admonition to college students.

Trollope said: 'With reference to the habit of reading, I make bold to tell you it is your pass to the greatest, the purest, and the most perfect pleasures that God has prepared for his

creatures. Other pleasures may be more ecstatic. When a young man looks into a girl's eye for love, and finds it there, nothing may afford him greater joy for the moment; when a father sees a son return after a long absence, it may be a great pleasure for the moment; but the habit of reading is the only enjoyment I know, in which there is no alloy. It lasts when all other pleasures fade. It will be there to support you when all other recreations are gone. It will be present when the energies of your body have fallen away. It will last you until your death. It will make your hours pleasant as long as you live. But, my friends, you cannot acquire that habit in your age. You cannot acquire it in middle age; you must do it now, when you are young. You must learn to read and to like reading now, or you cannot do so when you are old.'<sup>23</sup>

Anthony Trollope's exhortation deserves to be hung in every library. Libraries and a great collection of books stimulate the love of learning, which influence, in the final analysis, characterizes the atmosphere of a true university. The stimulating atmosphere of a great collection of books has helped many a student to a reappraisal of values. The influence of books works silently upon the mind, uplifts the spirit, enlarges the student's vision, and moves him as though a stirring urge of the divine were at work within him. Books, research and an atmosphere friendly to learning provide the best stimulants to the origination and flight of ideas for penetration of the unknown.

My entire professional life has been spent within the walls of a university. It is the special privilege of the university surgeon, while he teaches students and supervises the surgical care of patients, to do research. It is indeed a unique and wonderful opportunity and, after all, is not such opportunity the greatest paymaster of the university clinician? Students receive their training at the hands of men, not curricula. Success lies not in the programme, but in the men who energize it.

The function of the teacher is to raise the student's sights upon the horizon and open new picture windows for him, to the end that he aspires to mobilize all his talents to reach far beyond what he considered himself capable of doing. The teacher's function is to illuminate the threshold of the student's mind so that he becomes his own best teacher.

The professor's most important role, I have come to feel, is to help create an atmosphere sympathetic to learning. In such an environment, industry and scholarship thrive, bringing out latent talents and the finest qualities in men. This is the first lesson of the educator. Men and the proliferation of ideas, emerging and generated in such a milieu, almost invariably prove to be the professor's greatest discovery. At Minnesota, my colleagues and I were privileged to extend opportunities to several of your native sons, two of whom I believe are in attendance at this meeting. They have put their talents to work in a way to which, I believe, the Great Master, who was critical of the use of talents, would have given a nod of warm approval. A research conference of my staff often conveys to visitors overtones of an international meeting with representation from as many as 20 countries and all continents. The talent to convert imaginative ideas into creative and workable concepts is a universal but latent faculty and only needs encouragement. Those of us privileged to represent educational institutions must see to it that young men for whom we are responsible have opportunities equal to their abilities. Sharing and partitioning opportunity is a guiding principle of all successful surgical teachers.

#### PRACTICE

Dr. George James, Commissioner of Health of the City of New York, points out that one of the expanding fields in medicine of the future will be in the rehabilitation and care of patients for whom there is no specific treatment. He feels that this important activity will become the responsibility of the general practitioner, who, in consequence, will be too occupied to compete with many specialists.<sup>24</sup>

Members of all professions come to know it is easier to create dissatisfaction than it is to find acceptance. However, acceptance is always warm and cordial when the motivation of professional people is not only beyond reproach, but enviable and commendable. Sympathy is probably the best



solvent for the ills of man. It is very unlikely that much sympathy will be found in a computer. Weelum MacLure, beloved doctor of Drumtochty, immortalized by Ian MacLaren in the *Doctor of the Old School*, is not a forgotten legend. Disregard of self and a dedicated devotion to his patients is still the guiding precept of a large segment of our profession here and everywhere, I am very certain. Medicine and love of humanity are inseparable.

#### *The Great and the Good Society*

Our President, Lyndon Johnson, has eloquently portrayed the role of education in developing 'the great society'.<sup>25</sup> Medical educators have a responsibility and an opportunity to contribute to the building of the good society. It is every physician's privilege to contribute richly to this important cause. The late Carl Eggers, a New York thoracic surgeon, well known to many surgeons here, paid a visit to his native Hanover shortly before his death, and was asked to inscribe his name on the city's official ledger. After a moment's reflection, he wrote: 'It is easy to do good and it makes one so happy'. Such is daily the great privilege of all of us, and particularly so in medicine.

#### *Liberal Support of Universities*

The interests of professions and the public are best served when our educational institutions, and especially our universities, are well supported. Some of you may remember the immortal words of the Poet Laureate of England, John Masefield, who said: 'There are few things more enduring than a university. Religions may split into sects or heresies; dynasties may perish or be supplanted, but for century after century the university will continue, and a stream of life will pass through it, and the thinker and the seeker will be bound together in the undying cause of bringing thought into the world.'<sup>26</sup>

Liberal support of our schools, universities, and professional colleges by the public is a sound, and probably the wisest, investment for a bright and glorious future for any country.

I wish to express my appreciation to Mrs. Jacqueline Smith, Assistant Surgical Librarian, for her help in tracking down many of the sources referred to in the table, most of which have been seen in the original.

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