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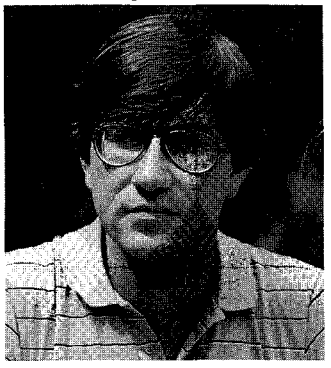
EDITORIAL:

One More Idea

Ronald J. Sanchez



Our Editorial Philosophy

We recently asked readers of the *AMWA Journal* to rate the publication in various categories and give us their suggestions and criticisms of the publication. We received far too few responses for the results to be statistically significant; yet we did manage to accumulate a variety of comments and recommendations that we will take into consideration during the next year.

In reviewing the responses, it occurred to me that few of our readers probably understand how the *AMWA Journal* operates. So here's a capsulized summary of our editorial position and how the publication is produced.

As the official quarterly publication of AMWA, the *AMWA Journal* is supported through association funds and limited advertising revenue. Manuscripts may be received from members and nonmembers of the association, and no publication priority is given based on an author's membership status. Our primary criteria in publishing a manuscript are that it is original, well written and well researched, relevant to the field of medical communications and that it offers a unique viewpoint or perspective on a subject from that previously published. Occasionally, we solicit manuscripts from authors on subjects that we are particularly interested in considering for publication. We do not reprint manuscripts that have been published in other publications.

The *AMWA Journal* is not a refereed journal; that is, each article is not reviewed by a panel of writers and editors. The decision to publish is made by the Editor-in-Chief, with consultation from various members of the Editorial Advisory Committee, as well as the Administrator of the Department of Publications.

We operate under a limited budget. We do not pay for any manuscripts and, likewise, all of the editorial work done for the *AMWA Journal* by AMWA members is provided on a volunteer basis.

Since I have been Editor-in-Chief, the purview of the publication has been kept intentionally broad to encompass not just articles on the technical aspects of medical communications but also on issues related to medicine, health and the media. It has been my philosophy that we, as medical communicators, do not exist in a journalistic "vacuum," but rather we are just one part of a larger communications process. I prefer to publish articles that instruct and educate, rather than those that merely inform.

Finally, I view the editorial philosophy of the *AMWA Journal* as an evolutionary process. We continue to grow and develop as we learn more about what you, our readers, need to enhance your efforts in the field of medical communications. We appreciate what you have to say.

Brain Drain

With all the public furor over the now-defeated 51 percent congressional pay raise, few people—including the news media—seemed to notice that the controversial provision also included a much-needed pay hike for scientists and researchers at the National Institutes of Health (NIH). That's too bad, because by pushing the Congress into its self-righteous rejection of its own salary increase, we managed to deal yet another crippling blow to research in health care.

During the past five years, NIH has lost 28 percent of its top scientists to the private sector—where they can earn more than twice as much and can have considerably more funding available to support their research projects. And NIH officials say that more high-level departures can be expected as a result of this latest salary setback.

It's unfortunate that the Ralph Nader-inspired rhetoric surrounding this issue focused almost entirely on the earnings of our senators and representatives and failed to recognize the other, and more significant, components of the proposal. With research on AIDS plodding along and with a cure or vaccine perhaps a decade (or more) away, this is no time to deplete our already slim research ranks by sending our most valuable resources shopping for new jobs.

It's amazing just how altruistic we expect our "public servants" to be. Entertainers, sports figures and business entrepreneurs can earn enormous sums—with our apparent sanction—but we expect those in government to be modestly paid. But with the pressing demands of a growing health care agenda, this is no time to pinch pennies. In the end, we'll pay the price—dearly. □

Mental Health Care Clouded By Stigma, Misunderstandings

Advances in psychiatry lead to more compassionate treatment for patients

HISTORY:

Bill Weaver

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The author wishes to acknowledge the contributions of Virgil Wooten, M.D., and Jeffery Fahs, M.D., both of the Department of Psychiatry, University of Alabama at Birmingham.

The history of mental health care in the U.S. is a story of medical need which has been met very slowly because of four factors: (1) stigma of the illness; (2) lack of understanding of its cause; (3) general low esteem of its professionals, and (4) slowness with which it became a respected field for academic study and research. While mental health care in the U.S. cannot be separated totally from work in Europe and elsewhere, this article is devoted exclusively to occurrences in this country. Furthermore, the historical part of this article concentrates primarily on the care provided in mental institutions. Thus, at best, this is only a half-history, but maybe it will provide a glimpse of where the field has been, as a basis on which to assess where the field is now and to predict where it may be in a few years.

The Past

Mental health care today has improved greatly from the past. No longer are hospitals called asylums, mentally ill persons called lunatics, substance abusers called opium eaters, and psychiatrists called alienists. No longer is all mental illness categorized simply as insanity and isolation from the rest of society without treatment thought to be the best therapy. And no longer is the profession characterized by the hopelessness of its patients. Indeed, times and labels have changed.

The 18th Century

It is unclear just how much 18th Century physicians in the U.S. knew about mental illness, but it is certain they did little to treat it. Considering their habit of leeching, purging and emitting in the treatment of other illnesses, however, this neglect may have been a blessing in disguise. Because physicians believed mental illness to be incurable, they devoted little attention to it, choosing instead to work with patients who could more readily appreciate their efforts. Consistent with the medical community, the public also assumed mental illness to be incurable and was satisfied to isolate such persons either in the home, in a private hospital if they could afford it, or in the poorhouse or jail. In all of these locations, the primary mode of therapy was isolation, regardless of the type of mental illness.

The 19th Century

Unlike its predecessor, the 19th Century witnessed many changes in the care of mentally ill persons. To a large degree, the changes that occurred in the field resulted from three things: (1) changes in the understanding of causation; (2) changes in the number and nature of mental institutions, and (3) changes resulting from the rise of psychiatry as an academic field.

The 19th Century witnessed important changes in the understanding of the causes of mental illness. Although there was little formal education in psychiatry until near the end of the 19th Century, some physicians obtained practical knowledge by working for a year or so at a mental institution; many of these physicians later became asylum superintendents. Without a psychiatric classification system, psychiatrists referred to all mental illness as insanity, and they were convinced it was a disease of the brain. Thus, they believed that in every insane person one could find physical evidence of brain disease. As time passed, however, these evidences of physical damage to the brain could not be found on autopsy, a fact that caused some psychiatrists to abandon this theory.

By the mid-19th Century, the prevailing view was that there were two types of causes of mental illness: (1) predisposing causes (physical defects of the brain), and (2) precipitating causes (irritants in the environment which by aggravating the predisposing causes actually precipitated occurrences of insanity). Thus, by mid-century, insanity could be explained more fully, and because of it, changes occurred in the type of treatment thought to be most effective in the care of the mentally ill.

In the early decades of the 19th Century there were few institutions, and they were largely private ones, catering to affluent patients. Through the efforts of Dorothea Dix and other reformers, the nation became more aware of the needs of the mentally ill, and this awareness led to the establishment of state-supported institutions in most states. With the large influx of poor immigrants and the emergence of state-supported institutions, the patient population at these institutions increased very rapidly and became less economically selective. Asylum superintendents worked hard to convince the public of the appropriateness of the asylum for mental health care. They were very successful, with institutions growing rapidly—more rapidly than state appropriations to support them. Thus, each year asylum superintendents had to devise new ways of ensuring the survival of their institutions on the straight line or decreasing state support. Under these conditions of perpetual financial constraint, asylum management became a science.

Ironically, help for institutions' financial survival came from a treatment plan that called for the use of patient work as a means of normalizing the patient's living environment. The widespread belief in the early 1800s that insanity was incurable had encouraged the use of custodial care that wasted no effort on therapy. But by mid-century, with their newly adopted belief in predisposing and precipitating causes of insanity, psychiatrists began to believe that insanity could be cured and that institutions should replace their custodial role with one that involved more aggressive treatment. They were convinced that if precipitating causes (family conflicts, economic stresses, political or religious excitement, and many others) could be eliminated, the natural healing process of the brain would take care of predisposing causes. They found just such a therapy in something known as moral treatment, a therapy very similar to today's psychological or milieu therapy.

'Thus, they believed that in every insane person one could find physical evidence of brain disease.'

Moral treatment is of particular significance because of its widespread popularity in the mid-1800s, its unpopularity in the late 1800s, and its gradual reintroduction into a much broader spectrum of treatment in the 20th Century. Moral treatment emphasized the asylum as ideal for three key steps: (1) identifying the precipitating causes for each patient; (2) removing those causes while leaving the rest of the patient's life as normal as possible, and (3) preparing the patient for life outside the asylum. To carry out this approach, asylums operated as small societies in which idleness was replaced by systematic work, and improvement by the patient was expected.

Early institutions that tried moral treatment reported successful results. More psychiatrists implemented the program at their asylums, and soon cure rates of up to 90 percent were reported. In their literature, asylum superintendents devoted much attention to descriptions of how they implemented and managed their moral treatment programs.

The bubble of enthusiasm and optimism was short-lived, however, when it was discovered that the cure rates that asylum superintendents had reported so proudly involved inaccurate calculations. The cure rates had been derived by dividing the number of discharges by the number of admissions, with some patients having been admitted, discharged and counted as "cured" several times in a year. Whether this was a simple statistical reporting error or deliberate deception, the effect was to discredit asylum superintendents, asylums and moral treatment. The pendulum had swung far in the direction of curability—too far, in fact.

For several years thereafter, psychiatrists were disillusioned, as was the public with them. Most of them abandoned moral treatment and reverted to little more than custodial care for their patients. The optimism that pervaded the field in the earlier decades was gone. Instead of concentrating on therapy, asylum super-

intendents devoted more attention to issues related to managing institutions, as economic wizardry in asylum management became a necessity.

While disillusionment over the curability issue did much to cause a reduction in the therapy practiced at asylums, another important factor was the change in the population of the asylum itself. The rapid growth in the number of institutions was accompanied by an even more rapid growth in the size of institutions and in the economic diversity of their patients. Some asylum superintendents viewed the limited potential of their poorest patients as a reason to devote little time to active therapy.

In 1844 superintendents had professionalized their field by forming the Association of Medical Superintendents of American Institutions for the Insane. In the association's journal, the *Journal of Insanity*, superintendents devoted much attention to management issues, a fact that made them a target of criticism from other physicians, particularly neurologists.

Beginning with Benjamin Rush in the early 1800s, several physicians demonstrated an interest in the care of the mentally ill. As the demand for hospital superintendents increased, several physicians obtained whatever training was available. Because asylum superintendents were necessarily preoccupied with their institutions' economic survival, study and research in psychiatry tended to be a minor consideration with them, at least until the 1880s. Psychiatry as an academic field did not emerge until the late 19th Century, and only then in response to external criticism. The criticisms, made primarily by neurologists, contended that hospital superintendents were content to provide domiciles for patients without making any scientific inquiries into the intricacies of their patients' problems. Although the charges may have been true, neurologists may have been at least as interested in advancing their specialty as in improving the academic level of psychiatry. To be sure, hospital superintendents had little time for research, but the sting of this criticism advanced a movement that had already begun to initiate formal study of the mind as a part of medical training programs. This was begun but not fully incorporated in most medical schools until after 1900.

'Mental hygiene introduced an increased emphasis on hereditary and environmental deficiencies as major contributors to mental illness.'

While the 19th Century witnessed many changes in mental institutions themselves, the 20th Century brought few changes in institutions and more changes in the field of psychiatry. Although most psychiatrists continued to be affiliated with mental hospitals, the thrust of their specialty was increasingly away from institutional practice, and the traditional relationship between psychiatry and mental hospitals was beginning to dissolve. As evidence mounted of their low status in medicine, psychiatrists began to look beyond the mental institution to settings that seemed more academically inclined. In an effort to improve their image, psychiatrists renamed and reoriented their primary professional organization into the American Psychiatric Association and formed the American Board of Psychiatry and Neurology, to encourage more academic rigor in both psychiatry in general and psychiatric training programs in particular. Some psychiatrists began to criticize the traditional mental hospital's emphasis on custodial care for large numbers of chronic patients, especially as little effort was being made to establish maximum limits on the number of beds at mental institutions.

The rise of psychoanalysis and the mental hygiene movement brought more changes in the field. Psychoanalysis encouraged psychiatrists to look at mental illness in a new way, and by mid-century, many of the principles of psychoanalytic thought had become integrated into the overall practice of psychiatry. Mental hygiene introduced an increased emphasis on hereditary and environmental deficiencies as major contributors to mental illness.

As important as these developments were, the 1950s, 1960s and 1970s, sometimes known as the "biochemical revolution," brought *some* noteworthy improvements and *some* mere conveniences. While the identification of biochemical imbalance as the cause for some disorders was an improvement, the development and widespread use of sedatives to create a more docile patient population with little consideration of patients' chances of recovery proved to be a mere convenience to hospital staffs.

The Present

Psychiatry is on its way to becoming a scientific discipline, something that has been facilitated immeasurably by biological psychiatry. Biological psychiatry has provided psychiatry with a new basic science, new treatment methods and the kind of thinking necessary to operate within the confines of an empirical science. In short, psychiatry is more firmly tied to the medical sciences than to the social sciences. Advances in behavioral neurology and neuropsychiatry have suggested that various areas of the brain "specialize" in certain types of thought, language processes and mood processes.

Despite its progress, psychiatry is still unable to offer etiological explanations for most of the major psy-

chiatric disorders and, thus, is unable to offer improved treatment for patients with these disorders. The most effective treatments available today derive from drugs developed two or three decades ago, many of which were developed for other purposes but were found to have psychotropic properties as well.

Today, more so than ever before, mental health professionals understand and appreciate life history as a factor in persons' mental behavior, believe that no one treatment method is appropriate for all illnesses or for all patients with a particular illness, and recognize and appreciate the interrelationships between physical illness and mental illness. With **DSM III**, the diagnosis manual, mental health professionals have a comprehensive, detailed, multidimensional taxonomy. In addition, assessment methodology—standardized criteria, rating scales and the standardized psychiatric interview—has been refined and substantially improved. As mental illness is determined to be more "biological" in nature, there is a resulting reduction in the stigma associated with it.

Despite some in-roads, little improvement is being made in the extent to which primary care physicians appreciate the frequency of mental problems as underlying causes of other illnesses and demonstrate skill in recognizing the various subtle manifestations of mental illness in their patients.

The Future

Although one can only speculate on what will occur in the future, there are indications that major accomplishments will occur. It appears certain that psychiatry will become more recognized as a medical field as it becomes more "biological" in its work. It also appears certain there will be a continuing need for so-called "talk therapy."

Some of the advances that appear to be on the horizon are the following:

1. Because certain endorphin fragments seem to be natural antipsychotics, a better understanding in this area offers some real hope for many patients.
2. The fact that there are specific binding sites in the brain for the hallucinogen PCP might lead to a new biological model of schizophrenia and development of new treatment methods.
3. The hope of finding markers of psychiatric diseases remains alive, although those already known are not specific or reliable.
4. Dissection of psychiatric syndromes into their component psychological dysfunctions could be the next phase in the evolving process of diagnostic sophistication.
5. Neuroimaging techniques should further our understanding of brain function in particular disorders and help determine how medications work on those areas.
6. More knowledge on the molecular biological basis of psychiatric disorders should enable the development of effective drugs for those disorders.
7. Mental well-being will become increasingly recognized as an integral part of the healing process of any type of illness, and all physicians' training will include more emphasis on psychiatry.
8. As psychiatry becomes more biological in its treatment and as mental well being becomes more generally recognized as a part of the healing process, the stigma of mental illness will be correspondingly reduced.

'It appears certain that psychiatry will become more recognized as a medical field as it becomes more "biological" in its work.'

Conclusion

Psychiatric treatment in the U.S. has evolved over the last 200 years from isolation to involvement, from at-home to institutional care, and from custodial to therapeutic care. While psychiatry has become and is becoming more research-oriented, the work in mental institutions necessarily remains centered on practical application, normalization of life within the institution and attention to individual differences. Most importantly, the outlook for persons with mental illness is brighter than it has ever been, and even more improvement may be seen in the not-too-distant future. □

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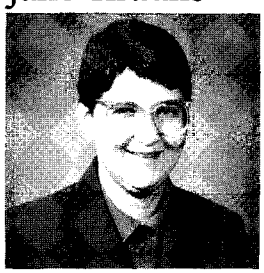
Space-Age Research Adds To Progress in Medicine

Technological transfer brings new tools, information to an already expanding discipline

TECHNOLOGY:

Jane Krauhs



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The U.S. space venture promotes scientific and technological advances because new information and tools are needed to achieve its objectives. The long-term investment necessary for such a program—offering no guarantee of financial reward—could not have been undertaken by private industry. The National Aeronautics and Space Administration (NASA) has returned taxpayers' investment by promoting non-space-related applications of the products of space-related research and development. These secondary applications now number more than 30,000.[1] Many of them have contributed to what we call "medical progress."

Why "Spinoffs"?

When NASA was created, it was directed by the Congress in the National Aeronautics and Space Act of 1958 to "provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof." Transfer of space technology is built into the structure of NASA, in the form of scientific programs and as an outgrowth of the nature of spaceflight problems and the approach to their solution.

The Technology Utilization Program helps bring NASA technologic developments to entrepreneurs, some of whom are former NASA employees. Each NASA field center (Ames Research Center, Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center and Langley Research Center) has a Technology Utilization Office, which publicizes research and development activities at that center and acts as a liaison between center personnel and potential users of technology produced there. These offices also arrange conferences to inform private companies of NASA technology and the technology transfer process. The highly successful Small Business Innovation Research Offices at NASA research centers solicit novel proposals from small businesses for development of technology needed by NASA. Ten Industrial Applications Centers (IACs) are affiliated with universities, and NASA recently has set up cooperative arrangements with technical assistance centers sponsored by state governments. The IACs provide access to 100 million documents in the NASA data bank and other databases. NASA's Computer Software Management and Information Center (COSMIC) at the University of Georgia identifies government-developed software programs that might have secondary applications.[1] A current goal of NASA is to strengthen the engineering capacity of universities; toward this end, nine university space research centers were selected in 1988 as recipients of funding for long-term research in

space engineering and technology.[2]

Some of the problems NASA must solve are unusual and would have low priority for an Earth-bound population. The space agency brings together scientists and engineers from many disciplines to solve them. NASA scientists interact with colleagues at other government agencies, universities and industries and with students. This "interfacing" occurs through formal programs such as Resident Research Associateships administered by the National Research Council, through employment of consultants and college students, and through collaborative research projects.

Sometimes NASA contributes to the development of a "spinback," a device that will be used primarily for a non-space-related purpose but also will fulfill a need of NASA. NASA shares the cost and products of this development with private industry or other agencies. A current example involves the design of a flow cytometer that could be used for biomedical experiments on a space station. NASA is providing funds and technical leadership, the American Cancer Society is providing funds, and investigators at the University of Miami (Florida), Los Alamos National Laboratory and the University of California, San Francisco will be collaborating on the project. The new flow cytometer should be useful in monitoring the effectiveness of cancer therapy for individual patients.

Cities and states have become strong supporters of technology transfer. Cities like Houston, seeking jobs for their citizens, are trying to attract and nurture new industries. The proximity of the Johnson Space Center and the Texas Medical Center makes Houston an ideal incubator for "spinoff" companies in the field of medicine.

Human delight in the new and unusual surely plays a role in application of space technology. Advertisers have used this characteristic to sell products associated with the space program—powdered orange drink, "space age" stadium blankets, satellite-generated weather information. A letter to *Science* in support of a piloted expedition to Mars stated: "It is the enthusiasm we generate in our explorations that will anticipate new technology and new hope..."[3]

What Constitutes Medical Progress

Medicine progresses when research leads to new information or new tools for prevention, diagnosis or treatment of disease; when health information is disseminated to physicians and other health care providers and to the public; and when health services are delivered to greater numbers of patients. NASA-sponsored research has contributed to progress in all of these areas.

When the Apollo program began, spacecraft bound for the moon or other planets were sterilized, and the crew and samples they returned were quarantined. NASA developed techniques for sterilization and control of contamination; many of these now have medical applications on Earth.[4]

A dry heat technique used to sterilize the Viking spacecraft is now used by hospitals to decontaminate oxygen systems after patient use. New plastics and methods of sealing compartments also are used in the sterilization procedure. NASA's Jet Propulsion Laboratory developed the Aseptic Fluid Transfer System to preserve the sterile environment of spacecraft during launch preparations. It allows the aseptic connection of two bags containing sterile solutions. The connector is composed of two plastics that melt at different temperatures, arranged so that when a heat sealer is applied to two connectors placed together, they are made into one unit with a sterile opening between bags. The system has been approved by the Food and Drug Administration (FDA) for use with intravenous fluids and dialysis, and it should be applicable to blood transfer and reconstitution of powdered pharmaceuticals.[5]

A biological isolation garment developed for personnel working with lunar samples came to the attention of physicians at Baylor College of Medicine and was used by "David," a child with severe combined immunodeficiency. The garment is used to extend the germ-free environment of patient isolation rooms in hospitals. A different type of NASA-derived garment, which is disposable and blocks passage of particles smaller than 0.5 micrometer, is used in cleanrooms of pharmaceutical and medical equipment manufacturers.[4]

New Tools for Diagnosis

Some of NASA's most important contributions to medicine have derived from miniaturization, telemetry, digitization of images and new materials. Often several of these technologies have been combined in one product.

Digital image processing was developed to produce images of objects in the solar system (including Earth) from the bits of digital information gathered by unmanned spacecraft. Refinements of the technique enabled correction of errors, alteration of contrast and general improvement of the signal-to-noise ratio of the image. This technology has contributed significantly to recent medical progress, especially in the area of diagnostics. A NASA engineer who later became a radiologist thought of using satellite image enhancement techniques to simplify inter-

pretation in magnetic resonance imaging (MRI). He and engineers associated with Landsat image processing made MRI practical for medical diagnosis.[6] Computed tomography (CT) and angiography also have been improved by digital image processing. Advancements in ultrasonic scanning have been made by scientists at NASA's Jet Propulsion Laboratory; the laboratory was even awarded a grant from the National Institutes of Health (NIH) to further refine this imaging method, which is much less costly than MRI or CT. NASA scientists designed an instrument that can transmit and receive ultrasonic pulses simultaneously. Three-dimensional views of arteries can now be obtained with ultrasound, and three-dimensional computer-enhanced angiography—also originally developed for planetary imaging—gives even better resolution. A number of medical applications of ultrasound technology are being developed in NASA-supported projects.[5]

Image analysis has been applied to light microscopy in the form of the Automated Light Microscope System (ALMS), developed at the Jet Propulsion Laboratory. The ALMS can perform chromosome karyotyping in 7-16 minutes. Perceptive Systems, Inc., a Houston company founded by former NASA and contractor personnel, obtained a license to market the ALMS as Geneticscan.

Image processing technology also was used to design the VISISCREEN-100 Photorefractor Ocular Screening System, an instrument used to screen for visual defects in children. The VISISCREEN analyzes the retinal response of a subject to a flash of light. Its output is a color photograph of the eyes; the color of the pupils is affected by the presence of a defect, such as hyperopia or strabismus.[1]

An instrument using single-photon absorptiometry to determine bone density was developed for NASA because bone mineral loss is a potentially serious problem in long-term space flight. Dual-photon absorptiometry, which evolved from the single-photon method, is now widely used to detect osteoporosis in its early stages and monitor the effectiveness of treatments for it. NASA contributed to all technical revisions of single- and dual-photon absorptiometry. A scaled-down CT scanner that will provide three-dimensional views of trabecular bone now is being developed for NASA.

'A number of medical applications of ultrasound technology are being developed in NASA-supported projects.'

The weightless human body loses serum electrolytes, and the need to monitor these losses prompted NASA to contract with ORION Research of Cambridge, Massachusetts, to develop a method to analyze serum electrolytes that did not require the use of flammable gases, as the prevailing methods did in 1973.[5] ORION produced several instruments that relied on ion-selective electrodes rather than flame photometry. The first commercial clinical laboratory instruments that used more than one ion-selective electrode (sodium and potassium) were a direct result of this contract. These Space Stats are leakproof, portable, easy to use and require only very small amounts of blood. (A competing company, Nova, was started by a Johnson Space Center employee who worked on the project.)

The AutoMicrobic System® (AMS) was first made for NASA but found wide use in hospitals and is being re-adapted for use on Space Station Freedom. McDonnell Douglas Corporation developed the Microbial Load Monitor, an automated system for detection and identification of microorganisms on Apollo spacecraft. The instrument was not used on Apollo, but McDonnell Douglas created a subsidiary, Vitek Systems, Inc., to adapt it for Earth use. The AMS has been extremely successful in hospital laboratories. It requires a relatively small number (10^4) of cells. The AMS saves time and expendables; it can perform 30 tests simultaneously on a plastic card with test wells. The card is sealed after inoculation, a particular advantage in space where contamination of the environment must be avoided. The instrument scans the wells for chemical activity once an hour and compares its readings with identification data in its computer. Results are available 4-13 hours after specimen collection. Susceptibility of organisms to antibiotics also can be tested with this instrument.[5] The AMS used by hospitals is too cumbersome to carry on a spacecraft, but NASA has asked Vitek to make a compact version to use on the space station, where there will be a well-equipped Health Maintenance Facility.

New Tools for Treatment

The alloy Nitinol, composed of nickel and titanium, was developed for the space program. This unusually elastic metal, which returns to its original shape after it is bent, allowed compact packaging of such satellite parts as antennas before they were deployed. Nitinol is also an ideal material for the arch wires of dental braces, which exert continual pressure on the teeth and formerly had to be replaced or adjusted several times during treatment.

Medical uses have been found for some of the lightweight, cordless

tools developed for space exploration. A company that developed a drill to remove geological samples from the moon used the same technology to manufacture cordless surgical instruments.[7] Pelviscopy, a new surgical technique in gynecology, was made possible by lightweight, miniature instruments made of titanium. This technique can often be substituted for laparoscopy.

Measurement of bone density by the sensitive techniques developed for the space program has changed therapy for osteoporosis, as these new techniques revealed that many of the old therapies were useless. Diphosphonate etidronate was tested in a NASA weightlessness simulation (bedrest) study prior to its introduction to the market.[8]It is now used to prevent metastatic calcification and post-menopausal osteoporosis.

NASA technology was used for the initial development of the cardiac pacemaker and for improvements over the years. Hybrid circuit technology was the basis for the original pacemaker, which had short-lived mercury-zinc batteries. At the suggestion of The Johns Hopkins University's Applied Physics Laboratory, these later were replaced with rechargeable batteries like those used in satellites. Pacemakers became programmable when Pacesetter Systems of Sylmar, California, built a device with two-way communication using telemetry developed by NASA to communicate with satellites. The physician can program as many as six functions such as the rate, amplitude and width of stimulating pulses.[5]

A laser designed by NASA to measure ozone in the atmosphere attracted the notice of surgeons looking for ways to eliminate atherosclerotic plaque with a laser beam delivered through fiber optics. Physicians at the Cedars-Sinai Medical Center in Los Angeles and scientists at the Jet Propulsion Laboratory in Pasadena, California, developed an instrument for surgery. A catheter only 1.5 mm in diameter but containing 5,000 bundles of glass fibers is threaded through an artery. The laser beam and light for illumination are carried by an outer ring of fibers, while a camera lens is attached to the end of the inner fibers. This arrangement allows the surgeon to find areas with plaque buildup and destroy the lesion with bursts of laser beams.[8] (Will video games someday be part of a surgeon's training?)

One of the most widely publicized "spinoffs" still under development is the Programmable Implantable Medication System for delivery of insulin to diabetics. Like the pacemaker, it is a product of collaboration between Johns Hopkins University's Applied Physics Laboratory, NASA (Goddard Space Flight Center), Pacesetter Systems, Inc., and Parker-Hannifin/Biomedical Products Division, Irvine, California. The PIMS is in the clinical testing stages now. It consists of an infusion pump implanted in the patient and a unit that programs the pump after implantation. Both the pump and the programming unit use NASA-developed microminiaturized hybrid circuitry. Telemetry like that used for the Small Astronomy Satellite allows the programming unit to communicate with the pump. Parker-Hannifin provided the pump, which was based on the fluid control system used to dispense nutrients in tests for the presence of organisms in Martian soil samples.[5]

At the request of the American Foundation for Autistic Children, the Applied Physics Laboratory and NASA are developing a Self-Injurious-Behavior Inhibiting System that would provide a new method of administering shock, the most effective stimulus for suppressing self-injurious behavior. When an accelerometer in the SIBIS detects self-injurious events, a signal is transmitted to a stimulation module. A patient fitted with a SIBIS would not need to be restrained and would not require intervention by another person.[5]

New Information from Space Research

Medical research has benefited from many of the instruments described above. Other devices generated by the space program were specifically adapted for use in medical research projects. One of these is a solar dosimeter used to measure sunlight exposure of infants in a study of vitamin D production. An engineer working on the project read in the NASA publication *Tech Briefs* about a solar dosimeter developed by Langley Research Center and obtained a license from NASA to fabricate a modified version of the dosimeter for use in the study.[1]

An instrument designed for use in a Spacelab experiment is now being marketed to cardiovascular physiologists for research in kidney function and control of blood pressure. The Baro-Cuff, from Engineering Development Laboratory, is a silicone rubber cuff strapped to the neck, stimulating the pressure-sensitive receptors in the carotid sinuses by pressure or suction.[9]

A number of scientists, including the authors, are engaged in NASA-sponsored basic research in space medicine. Space medicine approaches human physiology from a different point of view and for that reason makes unique contributions to medical research. When experiments are performed in space, we see how the human body responds to conditions that can be duplicated on Earth for no more than 30 sec-

onds. Microgravity experiments stimulate interest in comparing microgravity with hypergravity, which presents still another unusual stimulus and another perspective for understanding the "normal" human body.

Research in space medicine generally concentrates on the areas in which weightlessness is known to have potentially deleterious effects on humans and includes finding ways to prevent or ameliorate these effects. The solutions to problems of space medicine will be applicable to many medical problems on Earth.

During weightlessness, the lack of hydrostatic pressure causes a change in distribution of body fluid. Fluid redistribution is believed to lead to changes in cardiovascular function and to loss of body fluid and red blood cell mass. The lack of gravitational pull on weight-bearing bones and muscles promotes muscle atrophy and loss of bone mineral. The body adapts to weightlessness, but the effects of space flight can delay return to normal activities after landing.[10]

Bedrest, especially with the head down, is often used to simulate weightlessness because fluid is thought to be redistributed in the same way and bones and muscles are "unloaded." When NASA started supporting bedrest studies, people were staying in bed for long periods of time while recovering from giving birth (2 weeks) or operations like appendectomies or hernioplasties (2-3 weeks). Physicians thought these patients were weak because of childbirth or surgery, but NASA studies showed that bedrest itself caused weakness. As a result, the period of bedrest after surgery was shortened, and patients recovered more rapidly.

Physicians formerly thought the anemia experienced with chronic diseases was secondary to the diseases. NASA research has shown that red blood cell production decreases during bedrest because of inactivity. The reason for loss of red blood cell mass during space flight is being investigated by NASA.

After landing, astronauts often have difficulty standing, a problem also encountered by patients becoming ambulatory after a long period of bedrest. Paraplegics and quadriplegics have severe orthostatic intolerance when they first assume an upright posture and try to ambulate with mechanical or other assistance. Orthostatic intolerance is also a common problem in elderly people and even in healthy young people who have become dehydrated. NASA's research to prevent orthostatic intolerance in returning astronauts should benefit patients who might develop this condition. NASA scientists are studying the relationship of baroreceptor reflex function, body fluid distribution and vascular resistance and compliance to orthostatic intolerance. Reduced cerebral blood flow, cardiac arrhythmias and cardiac volume changes are being investigated as causes of fainting or near-fainting after standing. NASA is developing countermeasures, including drinking fluid, taking salt tablets and applying suction to the lower half of the body (lower body negative pressure, LBNP). LBNP has been used successfully at the University of California to treat patients with pulmonary edema and congestive heart failure.

High blood concentrations of calcium and certain other conditions of space flight, such as a tendency to drink less fluid than usual, have led to a concern that the risk of renal stone formation might increase in space. Research in this area has obvious applications to urologic problems on Earth.

Space motion sickness has plagued about half the Space Shuttle astronauts, and the vestibular system is thought to be involved in the etiology of this illness. NASA research is contributing to the basic understanding of vestibular function. Space is the ideal vestibular laboratory, because in the absence of gravity the vestibular receptors respond only to head movements.

Investigators supported by NASA discovered cells in the brainstem that do not differentiate between vestibular, somatosensory and visual input. This has been known for less than 10 years and has changed our understanding of vestibular function.[11] NASA-sponsored research can be expected to enable physicians to treat many patients complaining of dizziness. New drug treatments for motion sickness on Earth, such as the scopolamine patch, are the result of NASA-sponsored research.[12]

Delivery of Information and Services

Delivery of medical services to patients and medical information to physicians and the public is as important to the individual patient as new diagnostic and surgical technologies. Telemetry and miniaturization have made medical instruments portable and brought patient and physician together.

Although telemetry was not developed by NASA, it was essential to the space program for tracking satellites and many applications of the basic idea were developed for NASA. From telemetry came biotelemetry, long-distance acquisition of physiologic data. Now we have "telemedicine," a combination of electronic medical monitoring systems and communication by telemetry and satellite.[4]

The Portable Medical Status and Treatment System (PMSTS) applies microminiaturization, telemetry and other technologies developed for astronaut monitoring to providing emergency medical services in remote areas. A trained medic using

this system can monitor and record vital signs and restore rhythmic heartbeat with a defibrillator. The emergency attendant can use the PMSTS and telephone line to send medical data to a physician. The PMSTS was developed by a Houston company, Narco Scientific Bio-Systems Division. The company also makes Porta-Fib III, a similar device to be used in hospitals. Both systems were derived from the Physician's Black Bag, a portable unit for monitoring and treatment developed for the Johnson Space Center by Telecare, Inc., which was acquired by Narco.

'Sophisticated space medical systems may enable us to establish better methods for individualizing medical treatment.'

Telemedicine is used to provide health care on a regular basis to the Papago Indians, who live in villages in a remote area of Arizona. Physicians at a hospital monitor consoles to observe medical data from patients visiting the Mobile Health Unit, which calls at each village. Television allows the physician to examine the patient and prescribe treatment to be carried out by paramedic personnel on the mobile unit. Information the physician obtains by telemedicine can be used to determine whether the patient should be transported to the hospital. Telemedicine is also used in Alaska and on merchant ships.

NASA scientists have used information about how well the Papago health care facilities work to develop systems for future spacecraft. A Health Maintenance Facility being designed for the space station contains 1,200 pounds of equipment in 60 cubic feet. Instruments for diagnosis and treatment are included. The facility has attracted the attention of the Canadian government as a possible "emergency room" for sparsely populated areas.

The lixiscope (low-intensity x-ray imaging scope) is an x-ray image intensifier that can be brought to a patient's home or the scene of an accident for performing fluoroscopic examinations or checking for fractures. The technology that made it possible was first used to observe x-ray sources in space. Incorporation of a miniature x-ray generator into the instrument promises to widen application of the lixiscope.

Satellites make it possible for television to bring information about health to the most remote parts of the world; television may be the most important source of health information in rural areas of many countries. Many programs are produced by local or national governments, and the Spanish language program *Salud Familiar* is distributed by the U.S. Information Agency satellite system.

Future Medical Benefits

As NASA extends the limits of what humans and machines can do, we can look forward to continued impact of space technology on medical progress.

For Space Station Freedom and other programs involving long-term flight, a maximum amount of health care must be provided in as small a space as possible and with as little "invasion" of the body as possible. NASA will be searching for and developing noninvasive procedures for diagnosis. Collection, storage and transmission of medical data also will be critical to preserve the health of crew members and for functions such as monitoring exercise. A Medical Information Bus will be used for these purposes in the space station Health Maintenance Facility and could be adapted for use by emergency medical services on Earth. The "bus" enables all of the medical devices to communicate with each other and with the central computer of the facility. A computerized medical decision support system using artificial intelligence techniques is also being developed by researchers at the University of Florida for use on the space station. This medical library may eventually be put on laser disks and made available to physicians.[13]

Sophisticated space medical systems may enable us to establish better methods for individualizing medical treatment. The health of each crew member is critical to the success of each flight. Voluminous data will be available for each astronaut and can be used for diagnosis and treatment in space, as well as for such activities as monitoring the extent of physical deconditioning.

Space Flight and Medical Communications

Technology transfer is highly dependent on dissemination of information, the importance of which is well known to medical writers. Research and development related to the space program is described in a number of NASA publications, including *NASA Tech Briefs* and the publications listed in the references following this article. Patented inventions available for licensing are listed in the NASA Patent Abstracts Bibliography, published by the National Technical Information Service. Scientists engaged in NASA-sponsored research publish their results in the medical literature.

Space flight has contributed to more rapid and accurate medical communications through satellites and computers. Now "space-age" telecommunications and computers can be used to bring the science and

technology developed for space flight to medical science on Earth. We believe NASA has produced a handsome return on investment for U..S. citizens and that the space program will promote medical progress as long as communication is fostered between NASA and medical scientists. □

Many of our colleagues at the Johnson Space Center contributed information for this article, and we are most grateful to them.

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Members in the News

Joel Tau, a member of the Delaware Valley Chapter, recently was selected from more than 40,000 volunteers to receive the prestigious U.S. Volunteer of the Year Award from the Medic Alert Foundation International. Mr. Tau became associated with Medic Alert in 1986 as Chairman of the National Pharmacy Task Force Group, organized by representatives of the country's leading pharmacy organizations to increase public awareness of the Medic Alert program by making information available in pharmacies.

* * *

The ICI Pharmaceuticals/Newsearch Medical Communications Awards were presented during the 1988 AMWA Annual Conference in Philadelphia. The awards were presented for the best stories developed from leads found in *Newsearch.*

Kathy Lopate, of Waukesha, Wisconsin, won first place for "Loss of olfactory sense 'a rarely treated disability' " published in *The Medical Post.* Second place was awarded to *Maxine Karpen,* of Woodmere, New York, for "An electronic patient," published in *Computer News.* Third place was shared by *Steven Haksha, DMD,* for "Going to the dentist no longer a huge pain," published in the *Ventura County (California) Star-Free Press,* and *Gerald McKee* for "Exit jogging, enter jarming," published in *Sports Medicine Digest.*

* * *

Martha S. Dwyer, of Randolph, New Jersey, has been promoted to Project Manager of Medical Publications of Sandoz Pharmaceutical Corp. A graduate of the University of Notre Dame, Ms. Dwyer joined Sandoz in 1987.

* * *

The Case Western Reserve University School of Medicine has named *Claudia M. Caruana* as its Journalist in Biomedical Research Fellow. Ms. Caruana, a New York-based medical and science writer, spent a week at the medical school, speaking with researchers, participating in discussions about journalism and observing medical procedures.

* * *

Adele Lubell, editor of the newsletter of the New York Chapter's newsletter in 1985-88, recently received several awards. She was selected to receive the American College of Radiology's First Place News Award for an article, "Liquid Gold Creates Safety, Costs Dilemma," published in the *American Medical News.* The same article also received an award of merit in the Society for Technical Communication 1988 competition. Ms. Lubell, who continues to head an active consulting and writing business, is currently a contributing editor to the *Physician and Sportsmedicine* magazine. Her article, "Artificial Ligaments: Promise or Panacea" also won an STC award of merit in 1987.

* * *

Computers Play Major Future Role In Quality Management

A new paradigm calls for measuring and rewarding the quality of care

TECHNOLOGY:

Anne Greer

Anne Greer is Marketing Communication Supervisor for 3M in St. Paul, Minnesota.

EDITOR'S NOTE: Though perhaps best known to the general public for its adhesive tape and abrasive products, 3M is also known in the health care industry for the more than 1,000 health care products it markets worldwide. 3M is one of the fastest growing and most diversified of the major health care companies in the world, with 1988 global sales in excess of $1 billion. The company participates in all major categories of health care, including computerized health information systems, medical supplies, devices and equipment, diagnostics, pharmaceuticals and dental products. 3M also works with Rush-Presbyterian Hospital in Chicago to offer a Total Quality Management program designed to improve hospital productivity.

Imagine that you could engage an average physician or hospital administrator in a multiple choice test. Imagine that you included this statement in your test: Changes in the American health care delivery system over the past 10 years have been:

a. Significant
b. Unsettling
c. Startling
d. Unnerving
e. All of the above

Chances are good that he or she would choose the answer "e."

To be sure, the health care delivery system in the U.S. has been beset—even besieged—by changes. We have witnessed the birth of the DRG system ... and the increasing demand for health care services by an aging population.

We have seen movement of services to alternate care sites and the formation of hospitals into buying groups. We have seen an increasing number of physicians and a decreasing number of practicing nurses.

We also have witnessed the emergence of AIDS as a major health threat—a disease that has extracted a heavy toll on the health care delivery system as well as our peace of mind.

We have seen increasing cost containment pressures put on providers and suppliers by insurance companies, Medicare and other payers.

The health care delivery system, once as solid and stately as an oak tree, is creaking and cracking under the weight of these burdens while *costs continue to escalate.*

Joseph A. Califano, Jr., former Secretary of Health, Education, and Welfare, wrote in the *New York Times Magazine* in 1988: "Health is devouring an ever-increasing share of our national wealth...nearly 12 percent of our gross national product. During 1986 and 1987 the price of American health care shot up at more than twice the rate of inflation."

And the bad part, says Mr. Califano, is that "a large portion of the money spent on health care is wasted."[1]

In the face of these problems, we are beginning to recognize the flaws within the old, activity-based paradigm ... where *delivery of service* was the major method to determine payment. We are now in a transitional phase, where we are beginning to recognize the imperative of a quality-based or outcome-based system.

Health care visionaries have begun to plant the seeds for this new system. Paul Ellwood, M.D., who popularized HMOs, proposed last year that all physicians administer brief health outcome surveys to their chronic care ambulatory patients and submit the results to a national data bank. The results, together with information on the patients' clinical conditions and types of medical interventions

used, would answer the bottom-line question — how effective was the physician?

Dr. Arnold Relman, who published Dr. Ellwood's article, has called outcomes management and assessment "the third big revolution in medicine in our time."

The head of the Health Care Financing Administration also is pushing for outcomes measurement.

An outcome-based system would focus on the total patient experience—not just a single activity or procedure in the health care delivery process. This new paradigm calls for measuring and rewarding the quality of care. It requires measuring long-term health outcomes, the acceptability of care, access to care, the quality of the physician-patient relationship and patient satisfaction. Such data have seldom been collected or used in any meaningful way in the past.[2]

This movement toward an outcome-based system would be impractical, if not impossible, without extensive use of computers.

Total Quality Management

This article offers a general overview of the role that computers play, and will play, in helping the health care system deliver on the promise of Total Quality Management.

First, I'd like to consider the concept of total quality. Just what *is* quality?

At 3M, we adopted a "Total Quality" approach back in 1979. We define it as *"meeting the customer's expectation."* First, we need to know what the customer expects. Then we set plans to meet those needs and wants. The customer is defined as anyone who is the recipient of our work; so, we have customers inside the company, as well as outside the company.

We invested money in quality training ... and on products that would improve our performance.

We found that quality saves money. In fact, in 1986, the last year for which we have figures, we achieved a savings of $55 million.

Hospitals and other providers are starting to recognize that "total quality" can help them survive. Quoted in a recent issue of *Hospitals,* Dr. Steven Steiber of Gallup Hospital Market Research stated: "The quality of health care is not a new issue by any means. But it is a new *criterion* by which hospitals will be more closely scrutinized," and, he adds, "by which they will likely even be *reimbursed,* in the not too distant future."[3]

'The quality of health care is not a new issue by any means. But it is a new ***criterion*** *by which hospitals will be more closely scrutinized.'*

Still another recent article notes that "80 of 130 [hospital] coalitions put *quality* at the top of their agendas for 1988."[4]

If "total quality" is a "white knight" to ensure organizational effectiveness, then "computer technology" is the swift, and sure-footed, steed on which it rides.

Many companies in the health information systems business are working closely with hospital financial managers, clinicians and others to develop computer technology that will:

- Improve the quality of care;
- Improve the quality of hospital operations;
- And, at the same time, improve the hospital's profitability.

Computer technology is on the verge of becoming a tremendous tool in that regard. I say "on the verge" because, historically, hospital information systems have been only marginally helpful in the areas of quality and cost containment. They have improved the speed and accuracy of collecting, storing and retrieving data.

But only recently have we begun to develop those systems' potential to *integrate* data, creating *information* that health care providers can use to decrease costs and increase quality.

Computers could be put to work on applications such as:

- Patient care plan suggestions;
- Clinical findings, to prevent oversight;
- Suggestions of possible diagnoses and procedures;
- Warnings or alerts;
- Standing orders;
- Identification of potential allergic reactions and contra-indications;
- Protocol implementation;
- Resolution of scheduling conflicts; and
- Options for drugs and options for test alternatives.

This is the type of information that can be generated through use of an "expert system."

For a description of an expert system, I went to an article in *Computers in Healthcare* magazine by Scott Slivka and John Morgan.[5]

The article said an expert system involves: "The joining of a comprehensive clinical database with sets of protocols, criteria and rules which replicate the expertise of individuals in specialized fields of clinical practice and management."

As an example, the authors cited a surgeon ordering medication for a hospital patient. The expert system would provide detailed information and suggestions from the "clinical pharmacy" component of

the system. It would compare everything known about that drug to everything known about that patient. It might suggest another drug and give the reason why.

Perhaps the patient had an allergic reaction to a similar drug, several years ago. The expert system also might provide a plan of how and when the medication could be administered, and how these would fit into the current care plan.

'We have come from a period that has been called "the most permissive possible". . . to one that may be too restictive.'

The system might identify potential reactions to other medication the patient is taking. Or a possible interaction with lab tests that have been scheduled for that patient the next morning.

"Thus," the authors explain, "an expert system is an information system that does more than just store and report data. It participates in and enhances clinical decisions."

All of this information plays a role in increasing the quality and decreasing the cost of health care.[5]

So how many years do we have to wait for these wonderful systems? To some degree, these systems are available today.

One of these systems is called HELP...

HELP system is an expert system developed over the last 20 years by a team at LDS Hospital in Salt Lake City.

The system performs many of the tasks previously cited, ranging from helping physicians reach a diagnosis to optimizing usage of expensive equipment to assisting in discharge planning.

This type of system—and coming generations—will play an important role in the future world described by futurist Jeff Goldsmith. In an article titled "2036: A Health Care Odyssey," from *Hospitals* magazine, Goldsmith writes: "The major vectors for change in U.S. health care delivery are scientific progress in biomedical research; technological innovations in diagnosis, treatment and clinical information systems; changing clinical practice (as influenced by the two forces listed above); and institutional and managerial strategies that bring innovation to the patient."[6]

In other words: computer technology and the human brains to use it.

Technological Advancements

Goldsmith describes everything from bedside terminals to computer-controlled implants that will allow more patients with serious illnesses to be sent home safely. He talks of remote fetal monitoring systems that can transmit signals over the telephone and other elaborate monitoring systems that will enable physicians to extend their therapeutic and protective powers beyond the walls of their offices or hospitals.

He predicts that systems providing continuous medication and patient monitoring will reduce the need to hospitalize patients, perhaps dramatically. "The patients of the 21st Century will be connected to their physicians or hospitals by webs of telemetry similar to those used in cellular communications," he says.

"Perhaps these communication webs will be coordinated or monitored by computer systems *that could trigger responses in advance of crises.*"[6]

Will computer technology really do all that?

Probably so. And probably more.

So where have we come from? And where are we going?

We have come from a period that has been called "the most permissive possible...for technology..." to one that may be too restrictive.

I believe computer technology is one technology that will thrive in this new era...because it offers the most promising avenue to total quality...to achieving the elusive dream of excellent clinical results, rendered by solvent providers, at a cost that payers are able to afford. □

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RESEARCH:

The Origins of the Scientific Paper: The IMRAD Format

The sameness of a manuscript's organization provides reliability

Robert A. Day

Robert A. Day is a Professor of English at the University of Delaware in Newark.

The greatest invention of the nineteenth century was the invention of the method of invention.

—A.N. Whitehead

A scientific experiment has not been completed until the results have been published. If we accept that statement as true, we then can appreciate the overwhelming correlation that exists between scientific research and scientific writing. We can see that one is the reflection of the other. Therefore, by studying the literature of science, we can learn something about the history of science. And, although comparatively little has been written on the subject, we can learn something about the history of scientific writing.

When we examine modern scientific papers, we see a certain sameness about them. That sameness derives from the fact—and it is a fact—that almost all research papers in the sciences are organized in the same way. That organization has come to be known as IMRAD, the acronym standing for Introduction, Methods, Results and Discussion. Why is this so? When did the IMRAD format develop?

The Early History

It is tempting to say it started with Hippocrates some 24 centuries ago. After all, it is Hippocrates who is credited with the "discovery" of the scientific method. And perhaps it did *start* then. However, I contend that the modern scientific paper, especially in our field of biomedicine, was born one century ago, not 24, and that it has come into widespread use only during the past 50 years.

Hippocrates' scientific method (usually stated as: identify a problem, gather relevant data, formulate a hypothesis from these data, and then empirically test the hypothesis) was fine as far as it went. But it lacked (or at least did not overtly state) what we now recognize as the cornerstone of the scientific method: the *reproducibility of results*. The reproducibility principle did not become established in biomedicine until the 19th Century.

Prior to the 19th Century, scientists and scholars communicated with each other orally, by letter and, after the invention of the printing press in A.D. 1455, by books. The first journals were established in 1665. The early journals were of course "letters" journals (some of which still exist). The style of writing was descriptive, usually chronological. ("First I did this, and then I did that," etc.)

The Real Beginning

Not until the latter half of the 19th Century did the style of scientific papers begin to change. The change

in style resulted primarily from the work of Robert Koch and Louis Pasteur. The famous "Koch's Postulates" and Pasteur's development of germ-free methods gave final confirmation to the germ theory of disease while at the same time administering the final *coup de grace* to the old theory of "spontaneous generation."

Until the development of the germ theory of disease, the practice of medicine could hardly be called a science. The practitioners of medicine were powerless to prevent or treat the plagues and other infectious diseases that killed by the millions. Once the germ theory was accepted, the practice of medicine did indeed become a science and the results have truly been spectacular.

One can argue, and I do, that Pasteur's greatest contribution was *his* ability to argue. For Pasteur, it was not enough to prove the germ theory to his own satisfaction. Pasteur was hounded by numerous, and important, adversaries, most of them fanatic proponents of the theory of spontaneous generation. Pasteur courageously, in his books and other publications as well as in personal and public confrontations, argued effectively and persuasively in support of his ideas.

Particularly, what Pasteur did was to describe his experiments in such exquisite detail that any reasonable person could repeat them and get the same dramatic results. And thus did Pasteur essentially demolish the opposition. And thus did he espouse the power of the principle we now call *reproducibility of results*. And thus, by establishing "methods" sections in his publications, he established the basics of the modern IMRAD paper.

Pasteur and IMRAD

In his classic *Etudes sur la Biere*, Pasteur's use of the IMRAD style resonates throughout the book. Each section of the book describes a particular "study," and these sections read almost like a collection of journal articles. I will quote a few sentences from one of Pasteur's most famous studies. (I quote from the English translation edited by Frank Faulkner and D. Constable Robb and published under the title *Studies on Fermentation* by Macmillan & Co. in 1879.)

The "Introduction" covers several pages in which Pasteur outlines the "vital energy" theory of Fremy. The last sentence (p. 54) of this Introduction states Pasteur's purpose in no uncertain terms:

> *We at once resolved to demolish M. Fremy's theory, by a decisive experiment on the juice of grapes.*

After this ringing statement of purpose, Pasteur immediately launched into a detailed description of the methods he used in this experiment.

> *We prepared forty flasks, capable of holding from 250 c.c. to 300 c.c. [from 9 to 11 fl. oz.] and shaped as represented in Fig. 8. These we filled with filtered must, which was perfectly bright, and which, like all acid liquids, would remain sound, after having been boiled for a few seconds, although the ends of the long curved necks of the flasks containing the must might remain constantly open for months or years.*

After describing how the 40 flasks were divided into four series of 10 flasks each and variously treated, Pasteur is then ready to present his results, in good IMRAD form. His first sentence (p. 56) makes this transition absolutely clear:

> *The following are the results presented by our four series of comparative experiments in the different cases.*

When Pasteur completes his Results (of course he doesn't use these headings, perhaps not yet realizing that he invented them), he then begins the Discussion. Again, his polemical style makes this transition (p. 57) abundantly clear:

> *These experiments cannot leave the least doubt on our minds: That must, if boiled, will never ferment when in contact with air that has been freed from the germs which exist in it in a state of suspension.*

'Until the development of the germ theory of disease, the practice of medicine could hardly be called a science. The practitioners of medicine were powerless to... treat the plagues and other infectious diseases...'

To again show that he was not a student of Dale Carnegie, Pasteur stated his central conclusion:

> *"Thus, the hypothesis of MM. Trecul and Fremy, according to which albuminous substances transform themselves into grains of yeast by the action of a peculiar vital force, is annihilated."*

IMRAD Comes of Age

In the 50 years or so following the work of Pasteur, many journal papers began to look "modern." The papers of Paul Ehrlich (Salvarsan) in the early 1900s, those of Alexander Fleming (lysozyme, penicillin) in the 1920s, and those of Gerhard Domagh (sulfa drugs) in the 1930s are reasonably good examples of "modern" papers. Insofar as the papers in the first half of this century were not "modern," the organization tended to be loose and the language excessively wordy.

After World War II, science became big business. The wonder drug penicillin (although "discovered" a decade earlier) was developed during the War, and the later 1940s and 1950s saw the development of strep-

tomycin, the tetracyclines and many other "wonders." It was no surprise that the federal government began contributing massive financial support to scientists producing these wonders.

This positive reason for supporting science was soon followed by a negative reason. In 1957, the Russians flew Sputnik around our globe. Thus, in fear of getting behind, our Senators and Representatives eagerly appropriated still more money for science.

Money meant research, and research meant papers. And our journals were virtually overwhelmed by manuscripts pouring out of our research laboratories.

What could be done in this crisis atmosphere? We look back now, and what was done makes obvious sense. The editors of the journals, themselves and working through their organizations, began insisting on tightly written manuscripts in the IMRAD format.

Eventually, in 1972, the IMRAD format became "standard" with the publication of the *American National Standard for the preparation of scientific papers for written or oral presentation* (ANSI Z39.16-1972). Some 45 organizations approved this standard, including the American Chemical Society, American Institute of Physics, American Library Association, Association of American Publishers, Council of Biology Editors, Medical Library Association and National Academy of Sciences.

In the 25 years since the adoption of this ANSI standard, the IMRAD format not only has been adopted throughout the sciences but also has spread to the social sciences and even to some professional journals in the arts and humanities.

In the early days of IMRAD, some editors and many writers argued that the IMRAD format was too rigid and that this rigidity would inhibit the personal "style" of authors. Later, many editors (if not writers) came to believe the great accomplishment of IMRAD devolved precisely from its rigidity. Scientific papers are now logically and rigidly organized in a format readily recognizable and understandable by their writers, reviewers, editors and readers.

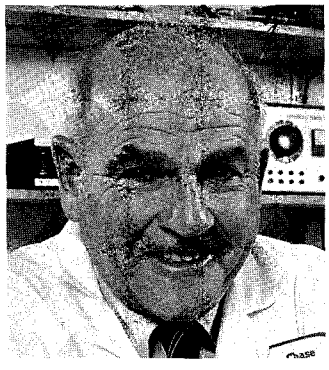
Medical writing is still not easy. And we all know that medical editing is still not easy. However, thanks to Pasteur and IMRAD, we are all following the same roadmap and we usually arrive at or close to the destination: the logically organized, well-written scientific paper. □

The Making of a Medical Television Documentary

A Nobel Prize recipient ventures into new areas of communication

MCGOVERN LECTURE:

Baruch S. Blumberg, M.D., Ph.D.



Baruch S. Blumberg, M.D., Ph.D., is Vice President for Population Oncology at the Fox Chase Cancer Center in Philadelphia.

The project—the production of the medical documentary "Plagues"—was begun on the initiative of Ms. Lenora Berson, a freelance writer from Philadelphia who, in 1977, asked me if I would like to create and narrate a series of television documentaries on medical history. I expressed an interest in doing so, since I had an amateur interest in history and in medical history in particular. I recently had been awarded (in 1976) the Nobel Prize in Medicine, and Ms. Berson thought it would be an opportune time for a medical history series to originate from Philadelphia, a city rich not only in medical history itself, but also possessing extraordinary library, academic and museum resources pertaining to the subject. We approached our local public television station, WHYY, with the concept for the production.

It was not until 1984 that the station director decided to proceed. Mr. David Othmer of WHYY was appointed Executive Producer. In the meanwhile, Ms. Berson had joined the government of the City of Philadelphia in the Office of the Mayor's Special Representative. The city decided to grant "start-up" money to hasten the project on its way, realizing that producing such a program in Philadelphia would enhance the city's image as well as add to the movie-making activities there. Our creative group decided the film would be shot primarily in the city and that institutional and personnel resources of the community would be used extensively in its production. It was not designed to be a "publicity film" for Philadelphia, but rather, in a subtle way, it was intended to convey positive images of our city to viewers.

Stimulated by this support from civic authorities and empowered with a financial grant, I prepared an outline of possible shows in a series that we thought might include as many as a dozen separate programs. We then convened a committee of academic, medical and scientific leaders from the Philadelphia area to serve as an advisory board to help select the topics to be covered and solicit reactions to our ideas. Our initial meeting could be described as exciting, vigorous and, in fact, heated. It was surprising to experience the level of controversy raised by what, at first glance, would appear to be a bland academic topic. However, in rereading my notes of the meeting I noted that, although there were differences of opinion, there was considerable agreement on how we should proceed, and a list of possible programs was drafted.

Reality Vs. Fantasy

What were the general themes we wanted to express? In discussing these, it might be useful to consider why I was interested in undertaking

this time-consuming project during a period when I was deeply involved in a fascinating research program. Basically, the major motivation was my passion for the movies. I'm a "twenty-fiver" (that is, born in 1925), and my generation went to the movies every Saturday, rain or shine, irrespective of what was showing at the "nabe" (the local neighborhood theater). I believe it was the novelist Norman Mailer who commented that for our generation, the littoral of the imagination was made up of the movies of the 1930s and 1940s. Our expectations of what life would be were molded by the images conveyed by the Silver Screen with all of its high morality, unreality and happy-ending messages. In my view, it provided an excellent distortion of how to view the world.

I've always been intrigued by the power of the flicks to sense the border-line between reality and fantasy. Movies are, in some respects, the most literal of the visual arts. In one sense they are exact images of reality—moving, breathing, colored as nature is or should be. But they are also very unreal; they are, in fact, flickering lights on a blank two-dimensional screen. The colors are more vivid than those of life, and the management of time, which we readily accept in a movie, is a gross misrepresentation of the linear dimension where we think we live. Take, for example, the movie "Blow Up," in which the whole story hinges on whether an enlargement of a photograph shows the feet of a murder victim partially concealed by a clump of trees. Reality is dependent on the discoloration of a few grains of a photosensitive chemical. The final charade of a mimed tennis game hammers home the ambiguity of reality and fantasy.

It may not be recognized that the scientific process also moves between fantasy and a testable reality. The scientist acquires a body of data abstracted from nature. From this he constructs a hypothesis or model guided by scientific laws that explains the data in a satisfactory and sometimes elegant fashion. A necessary feature of a scientific model is that it must be testable, but initially it is a product of the imagination (read fantasy) of the scientist. Having created this "image," the scientist is now obliged to test it against the harsh demands of reality by experiment and observation. If the imagined model survives these tests, it achieves a kind of reality in the sense that it can be used to predict future experimental and observational outcomes and, in some cases, can be applied for practical use, for example, as a medication. The data generated from this testing process can be used to make additional hypotheses and models, which are again subjected to a reality test. The scientist goes through repeated phases of imagination and reality reminiscent of the movie-making process in which there are rapid successional changes between the activity of the location, the technicalities of filming and sound recording, and the ultimate fantasy which requires believing that flickering light is life.

There were other themes we wished to incorporate into the documentary. We did not want it to be a dramatization of the ultimate success of scientific medicine, a relentless and ordered progress to problem resolution. That would be a distortion of history. On the contrary, problems are rarely totally solved; the solution of one always seems to generate others, and success is rarely, if ever, complete. We wanted the film to show this seeming paradox so fundamental to scientific research. We also wished to illustrate the process of discovery in a narrative style to illustrate that it is often, perhaps always, an indirect, Shandean sequence (as in Sterne's novel, *The Lives and Opinions of Tristam Shandy, Gentleman*) of events seemingly meandering from one unexpected outcome to another, and not the precise, linear, logical process that science is sometimes imagined to be. It also was not to be a story of the laboratory, hospital and clinic, but rather an account of the disease itself filmed in the field, the streets, the forests, the cities, the villages and the homes where disease occurs. It was to emphasize the contributions of public health and epidemiology in addition to those of therapeutic medicine.

Finally, I wanted to incorporate my own research into the actual story-writing and film-making, since I planned to do the film while conducting my regular work at the Fox Chase Cancer Center.

Based on the advice we received from our committee, the work of a cadre of researchers, and the general principles we established, a treatment for one program was developed. This was presented to several funding foundations in the Philadelphia area, and we obtained generous support from the Pew Charitable Trusts. Additional support was obtained from the Pfahler Foundation and the Pennsylvania Humanities Council. We were gratified to find these funds for an essentially untried concept and certainly an inexperienced television narrator.

Writing the Script

Enough philosophy for the moment and on to the mechanics of actual script writing. We never really had a full script, or, if one did exist, I never saw it. The directors, the producer, one or more researchers and I would sit together and I would tell stories about epidemics culled from my general knowledge, medical training and previous historical interests. The others then would indicate which of these they considered most interesting, contribute stories and ideas of their own, and we eventually selected several diseases and themes that we thought

should be included as anecdotes in the film.

The researchers then were requested to obtain additional information on the topic and incorporate this into an essay that was added to other documentary material. The original source materials used by the researchers were often included in their reports, allowing me to read through them to check their interpretations and, in some cases, add medical insights. From this multiple-page document, the directors and I would prepare a shorter—one- or two-page—essay. Armed with this, the directors would prepare a script of the actual material to be used in the program.

An attempt was made to get the script to me in advance of the shooting date, but usually I saw my "lines" for the first time on location while the director of photography and other members of the staff were setting up their equipment. It is accurate to say I never once accepted the script exactly as it was prepared. Thereupon, a dialogue ensued between the writers and me—lively, even heated, creative, but never acrimonious. Added piquancy was provided by fading sunlight and the temperament of cameramen. Once their equipment is assembled, cameramen do not like to wait and, what is more, are well within their rights to charge overtime. We became expert at resolving script problems swiftly. I have enormous respect for co-producers Alan Goldberg and Marilyn Nissenson, professional writers, who allowed me to criticize (and in some cases ravage) their prepared script. They always took this assault on their egos with grace and style.

Having decided on the script I would then "narrate." Early in the process we decided it would be inadvisable for me to read the script using a teleprompter or similar device; a practice video revealed I would require glasses to read the text and the requisite "glare-free" specs were never obtained. I also discovered that memorizing a prepared script had disadvantages, such as loss of spontaneity, so, although I occasionally memorized a piece of script, for many of the takes I would paraphrase the words that had been written.

The whole process seemed makeshift; in effect we were creating the actual script more or less as we went along, although of course it was based on research and writing. Early in the process, when I had complained once too often about these informal arrangements, Mr. Goldberg told us that "Casablanca" had been filmed without a script. From then on I was happy to continue our style of filming, if it allied us with the Bogart classic.

Acting and Narrating

How did a reasonably content medical researcher, that is, me, suddenly find himself in show biz? The "official" story, of course, is that I was drinking a milk shake at Schwab's Drug Store in Hollywood, when Mr. Goldberg walked in, saw me, and exclaimed to the creative group that always accompany him like a cloud around a rain storm, "There sits a natural medical documentary narrator." The rest is history. I don't expect everyone to believe that story, and I'll provide some alternatives to it.

Actually, aside from a supporting role as a pilgrim in a Thanksgiving Day play in elementary school and the narration of a sophomoric speech at medical school graduation, intended to be off-color by the standards of the day, I had never acted on stage. Mr. Goldberg and the others had assured me this would be unnecessary for "Plagues" since I would be a narrator. My son-in-law, a senior editor with the British Broadcasting Corporation, gave me

'The whole process seemed makeshift...we were creating the actual script...as we went along...'

several items of advice: stand straight, look at the camera, imagine that you're talking to one or a few people huddled in front of their television sets in a darkened living room. The directors advised me to be conversational, speak rapidly and be "energetic." I realized I would not be acting but speaking, that I would not have to qualify for the former craft and therefore not have to join the actors union.

With this in mind I carefully avoided acting. However, problems arose. For example, we were filming a sequence in Australia at the former home of Thomas Austin, a rich farmer and herder who had imported wild European rabbits along with other luxury items from Britain to his home in Geelong near Melbourne. I was standing in the foyer of the enormous mansion he had built, describing the items in addition to the rabbits he had brought. When I said "wood for the staircase," I pointed to the stairs behind me. When I referred to the "stained glass for the windows," I pointed to the windows. When I mentioned the "china for his dining room," I pointed to the dining room on my right. Francis Kenny, our director of photography, objected. "Barry, don't turn to the right, it puts you in an awkward position." "Francis," I responded, "the dining room *is* to the right." He soundly advised me no one in televisionland would know that. "But Francis," I answered, "I know it. If I point to the right I'm narrating. If I point in any other direction I'm acting, and I'm not supposed to do that." Ever a spineless compromiser, during the retake I waved vaguely in front of me and considered it a con-

cession to art.

Another of the conflicts between fantasy and reality arose during the filming of the malaria sequences. We had planned to shoot these scenes in Fiji. However, just before our planned arrival, a military coup occurred, the first time for a political takeover in an otherwise stable government. We debated going anyway, but learned there had been disruptions of transportation and that an Australian film crew had been detained by the police. We then had to substitute Hawaii as a location for the filming; Hawaii was a stop on our round-trip ticket and would not increase our already considerable travel costs.

This solution resulted in another problem (as solutions always do). Malaria has never existed in Hawaii! Further, we were looking for a typical "jungle" location to film the sequences related to mosquito control. We selected the Lyon Arboretum of the University of Hawaii for this purpose. This also presented problems on the reality/fantasy interface. The location of the Arboretum previously had been a mountain pasture that had been given to the University. The curators then proceeded to plant tropical species from all over the world, and only a handful were native to Hawaii. The "jungle" certainly looked authentic but was, in fact, a meticulously designed human creation.

These "problems" may sound trivial, but they were recurring metaphors for the conflict between the scientist who imagines he is representing things exactly as they are and the filmmaker who knows he relies on illusion.

Anecdotes and Concepts

As a frequent movie-goer, I often read film criticism. In Philadelphia, we are fortunate to have several good critics who clearly enjoy the medium and, rather than telling you why they do or don't like a particular movie, explain what they think the writers, actors and directors had in mind when they created their films. Occasionally, I've read accounts written by the writer, director or others directly involved with the film, describing their intent and motivation. These have been particularly valuable and interesting, for it allows the analysis of the film in terms of the stated thought process of the creators. I will attempt to do that for several of the episodes included in "Plagues."

'. . .they were recurring metaphors for the conflict between the scientist who imagines he is representing things exactly. . .and the filmmaker who knows he relies on illusion.'

Early in our discussions, we decided that the style of the film would be anecdotal rather than didactic. We stuck to this plan with only two exceptions in which we tried to present ideas by the use of metaphor. These were the episodes in which we examined the "war against disease" model, and found it wanting, and the heavily symbolic use of the Daedalus myth to stress the problem-creating as well as the problem-solving character of scientific research. The former sequence was filmed on a moth-balled World War II Navy cruiser at the Philadelphia Navy Yard, and the latter in an elaborate yew hedge labyrinth (an illusion to the Daedalus story) at Hever Castle in southern England. In retrospect, I don't think these two abstractions were successful. My experience in presenting scientific lectures has been that, in general, audiences like stories, but they don't want to hear philosophy.

Influenza

In the 1918 influenza sequence, we wanted to convey the impact of a vast, worldwide, brutally destructive epidemic that affected all ages and both sexes. It was, with the probable exception of the Black Death of the Middle Ages, the greatest pandemic of all time, in which nearly half of the world's population was infected and about 25 million people died. The toll it exacted on individuals and families was dramatized by the testimonies of several people—residents of Philadelphia—who had survived the epidemic, but whose family members or friends had been infected or died. Nearly every family in this and many other communities was affected.

We attempted to explain why this disease spread so rapidly and widely. There had been a major change in the character of the influenza virus and there were few people alive who had ever experienced this new strain. As a consequence, there was little immunity against it and nearly everyone was susceptible to infection. However, as the epidemic continued into the fall, more and more people became infected. Not all developed the disease, and many became immune. Eventually there was a sufficiently large number of immune people in the population, and the virus could no longer spread.

The themes emphasized in this sequence were the mutability of the influenza virus in which a new strain had developed and eventual changes in the population that increased the "herd immunity." Another theme stressed was the terminology used for the disease (i.e., "the Spanish flu"), which indicated the desire to imply the foreign origin of a disastrous epidemic. People want to believe that bad things come

from elsewhere, and this can sometimes be incorporated in a name. This fear of contamination from others, from "outsiders," often leads to a demand for quarantine of the infected or those thought to be susceptible to infection. This may sometimes be warranted, but often is not, and can have destructive and unnecessary effects.

The influenza story also was meant to provide a basis for comparison with the current concerns we have with another serious epidemic, AIDS, and to point out that society has been down this road before. "Plagues" are not just a concern of the past.

Constant Change as a Characteristic of Epidemics-Myxomatosis

The notion of the changes that can occur in the infectious agent, in the population that provides the hosts for the infection, and in the environment in which they coexist was the theme of the Australian rabbit sequence. As noted previously, wild European rabbits were imported into Australia by Austin, a successful farmer and rancher who wanted to be surrounded by the familiar animals he had remembered from his childhood in southern England. Unopposed by any natural predators or diseases, the rabbits multiplied rapidly and spread thoroughout Australia. They competed with cattle and sheep for the available pasture and soon became the major agricultural pest in the country. (They actually provided the mainstay for an important industry in rabbit pelts.)

A variety of desperate measures was used in an attempt to control this "epidemic" of rabbits. In the 1950s a program to introduce myxomatosis, a virus deadly to the rabbits, was begun. Within a short time the virus had killed more than 90 percent of the rabbits in the area where it was introduced. The epidemic was followed carefully over succeeding years. It was found that the virus bcame less virulent with time, and in successive epidemics killed fewer and fewer rabbits. Also, it was possible to demonstrate that over the years of the epidemic the surviving rabbits and their offspring had become more resistant to the virus. Overall, the epidemic was less deadly than it had been at its inception. The population of rabbits and of viruses had adjusted so that they could coexist. Obviously, a virus could not be perpetuated if all of the susceptible hosts were killed.

In the meanwhile, the virus had been accidentally released in Europe. In a short time a large percentage of the rabbit population in Europe had been killed, but again the virulence of the virus decreased and the resistance of the rabbits increased. We dramatized the return of the virus to Europe by showing scenes in Austin's home village of Baltonsborough, England, where local rabbit hunters, old and young, discussed the rabbit situation before and after the myxomatosis epidemic. This lively conversation, in the nearly undecipherable Somerset dialogue, concerned the epidemic and its effect on the rabbits and the country people who depended on the rabbits to supplement their food supply.

The directors decided to center the dramatic focus of the rabbit story on the family that had brought them to Australia. The film sweeps from the village of origin directly into the mansion that Austin had built in Geelong in Australia. I was fascinated by this time-play. Although Baltonsborough and Geelong were separated by thousands of miles, and the location filming by months of time, in the show they appear to follow one directly on the other. This precipitated a near crisis, as I had to remember exactly what I was wearing in England, and duplicate that in Australia.

There was another interesting "time event" associated with this sequence. At the time we filmed in Baltonsborough, a group of sailing ships set off from London to reenact the voyage of the "First Fleet" which brought the first group of convicts to the new penal colony of Botany Bay in New South Wales. My daughter (who lives in England) and I witnessed this fleet sailing down the Thames past Greenwich on its way to the East. It didn't arrive in Australia until months after we had finished our filming there. It was fascinating to consider the different time scales of the filming, the film content, the historic events and the reenactment.

In the case of the influenza virus, a major change had made it more deadly. In the case of the myxomatosis virus, the changes had an opposite effect, and the disease became less deadly. This again has a bearing on the AIDS epidemic, in which it is feared that the currently common strains of the virus—which are, compared to other viruses, relatively difficult to transmit—could suddenly mutate to a more readily transmissible form. Although many strains of the AIDS virus now have been identified, none appears to have made this dreaded transition.

Cholera, Snow and the Scientific Process

Cholera has been and continues to be one of the most deadly and widespread diseases. It was mentioned in several places in the film.

We used the history of the disease to illustrate the application of the scientific process in determining how cholera is transmitted and the social and professional reactions to the discovery of its transmission. John Snow, a physician living in London, is one of the "heroes" of epidemiology. We focused on his contributions, drawing heavily on the account of studies given in his book, usually referred to as "Snow on Cholera."

Dr. Snow's work started with a series of mid-19th Century observations on patients with cholera. We reenacted several of these observations, using professional actors. Although the disease possibly could have been transmitted by a variety of methods, Dr. Snow was most impressed by the possibility of waterborne disease. He even postulated the existence of particles that were carried in the patient's excreta, entered the water supply, and then were consumed by others who also became ill; that is, something in the nature of a bacterium or other infectious agent. And, in fact, in each of these cases it appeared that the disease was always transmitted because people had eaten food or drunk water that contained the fecal waste of someone who had had cholera. This, of course, all happened before the establishment of the germ theory of disease by Pasteur, Koch and others, which occurred later in the 19th Century.

Based on these anecdotal observations, Dr. Snow made a formal hypothesis which was, in effect, a restatement of the message of the original "anecdotal" observations. He said that cholera was transmitted by materials (particles) emanating from the fecal waste of a patient that entered the water supply; this contaminated water then was consumed by others. In the scientific process, once a hypothesis has been proposed, even though it is a restatement of observations that have already been made, new data have to be collected to test it.

'One of the most striking features of the successful scientist is persistence.'

An opportunity arose to do this during a severe outbreak of cholera in London in 1854. Dr. Snow observed there were many cases in the area surrounding Broad Street, but unexpectedly several groups of people were spared. He determined that only those who drew their water from the Broad Street pump were affected, and postulated that the water from that well had been contaminated with fecal waste from a cholera patient. He then proposed an intervention experiment: he would remove the handle from the pump and observe if there were a decrease in the incidence of cases in the area. Indeed, there was a decrease. However, the formal experiment was faulted because the incidence of cases had been decreasing even before Dr. Snow had removed the pump handle, and it wasn't possible to say whether the decrease he had observed was due to the removal of the pump handle or to the natural waning of the epidemic.

One of the most striking features of the successful scientist is persistence, and Dr. Snow demonstrated that quality. He saw another opportunity to test his hypothesis. A few years after his original "experiment," there was another epidemic in London, but by this time several of the water supply companies had considered the possibility of waterborne infection. They had moved their inlet pipes downriver away from the contamination of the raw sewage coming from the densely populated sections of the city. Dr. Snow made his observations in a section of London where some of the households obtained their water from the company that supplied clean water and other households obtained water from a company still drawing its water from the polluted Thames near London. He predicted that those drinking the contaminated water would be far more likely to develop cholera. His prediction was correct.

This observational experiment was wholly convincing and it had a major impact on future water supply management procedures. However, the argument on the cause and transmission of cholera did not end; scientists still rejected Dr. Snow's contagion hypothesis well into the 20th Century. Prominent among them was Pettinkoffer, a distinguished German bacteriologist. He was so convinced that the cholera bacterium (which had been discovered by Koch a few years previously) was not the sole or even the primary cause of the disease, that essentially no data presented would cause him to change his mind. This can be a dangerous impediment to scientific process because it renders experiment and observation useless, in the face of granite-like belief. When a scientist equates his ego with the validity of his hypothesis, there is a danger that objective evaluation is impossible.

To compound this lack of objectivity, Pettinkoffer performed an experiment on himself and several of his colleagues. They drank bacteria from a culture supplied by Koch. There were no deaths, although they all became ill and one of his assistants seriously so. Yet, Pettinkoffer still interpreted this as supporting his views. He reasoned that cholera always resulted in death, and because he and the others didn't die, this implied that they

hadn't developed cholera. His strongly held views and the emotional impact of self-experimentation robbed his studies of any validity.

In "Plagues" most of the cholera sequence was shot on location in London, but we did an indoor scene—one of the few in the program—in the greenhouse of the Fox Chase Cancer Center where I do my research, showing our beautiful landscaped campus in the background. Our current research intruded into this; we gave a cameo appearance to a plant that we are currently using in our research to find a virucide for the hepatitis B virus. It's also a kind of coming attraction, as we plan to use the plant as the subject of a forthcoming episode in our continuing series of medical films.

Myth and Metaphor

In the Daedalus section of the program, we departed from the predominating anecdote-driven thrust and attempted to develop a concept using a Greek myth as a metaphor.

One of the most impressive characteristics of successful research is its apparent unending, and probably eternal, duration. Every time a problem is solved, another develops; each time we answer a question, we end up with several new ones that weren't obvious before the first experiment was done. This means that the more we know, the more we know about what we don't know!

The myth of Daedalus is fascinating because it illustrates the problem-solving and problem-creating character of science and technology. Daedalus is less well known than his son Icarus, probably because the boy was a flamboyant loser, but to me, the father was the more interesting character. Daedalus was obsessed by problem-solving, and he needed the constant stimulation of new problems, many of which he managed to generate, directly or indirectly, himself. I strung together in a monologue a series of stories about Daedalus collected from various places to illustrate the theme. The directors decided we should film the sequence, appropriately, in a maze as Daedalus is often associated with and sybolized by the great labyrinth he built on Crete. Our location scouts found a wonderful, high, elaborate yew hedge maze that had been built by William Waldorf Astor when, at the turn of the century, he acquired Hever Castle, originally the home of Anne Boleyn, the ill-fated wife of Henry VIII. We filmed on a glorious spring day, with brilliant sunshine, blue skies, green grass and exuberant gardens—in which I managed to get lost. The directors were concerned enough by this episode to acquire for me a two-way hand-held radio so they could locate me when I wandered off looking for plants in the long intervals between shots. This, to my recollection, was the only concession made to my star billing and general eccentricity.

Daedalus' problem-solving started when he was asked to deal with the passion that Pasaphae, the Queen of King Midas (of Crete), had developed for a great white bull given to them as a present by the gods. He resolved this by placing her in a hollow, life-size bull in which she was, in due course, impregnated by the divine bull. This solved the passion problem, but generated the beast Minotaur, who terrorized the country. Daedalus solved this by constructing the great labyrinth in which Minotaur was imprisoned.

However, another problem arose when Midas caused Athenian youths to be sacrificed to the beast. This was solved when the ever-resourceful Daedalus aided Theseus and his paramour Ariadne (the daughter of Midas and Pasaphae) to kill Minotaur and escape the maze. The next and most famous solution (well, partial solution) came when Daedalus and his son, Icarus, escaped the maze in which Midas had imprisoned them after the killing of Minotaur. The fate of Icarus is well known, but Daedalus escaped to continue his career of problem-management.

The scientist is intrigued by questions; he lusts after the unknown. In applied science and, in particular, in medicine, this implies that you rarely get perfect solutions, as new problems are generated by the process of discovery. Hence, medical science can rarely provide the assurance that a new medicine, a new procedure, is completely risk-free, although it can often be said that the risk is of very low probability.

We thought it necessary to make this point in presenting episodes in medical history. In fact, in none of the anecdotes do we imply that the solutions have been ideal, but always leave the episode with some degree of uncertainty remaining. We have not used the model often used in medical documentaries, that the story of science is a logical progression from a big mystery to a total solution. On the contrary, there is always much left for further discovery, a ceaseless search. It can be inferred from this that the consumers of the products of medicinal research, that is, patients, should adjust their expectations to reality. Very often, the good is better than the perfect, particularly when the latter cannot be achieved.

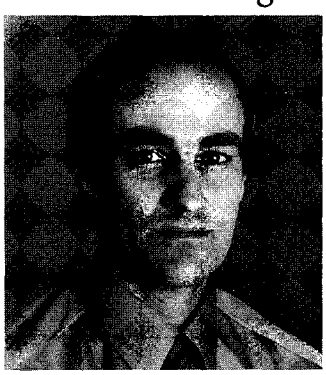
Making "Plagues" was exciting, instructive (to me) and fun. I hope we will be able to create more sequences of this medical history series. □

PUBLICATIONS:

The Style and Substance of The Medical Journal Industry

Interesting issues of scholarship and economics envelop the field

Thomas A. Lang



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Science and technology depend heavily on a vast and cumulative body of knowledge. The quantity, quality, comprehensibility and accessibility of this knowledge determine to a large extent the degree to which science and technology can be applied to improving the human condition. Much of this scientific knowledge is contained in technical and professional journals. Yet, as important as these journals are to human endeavors, their production, distribution and quality have not been widely studied.

This relative lack of attention to our scientific information base extends into the medical literature as well. An overview of the industry of medical journals reveals several interesting scholarly, economic and communications research issues. Thus, this article reviews the general structure, scholarly importance and economics of medical journals. It describes some of the constraints under which these journals are published and details some of the problems encountered in studying the selection and distribution of medical information. Many of the topics are illustrated with examples from the leading general medical journals.

The Structure of the Industry

The scientific journal industry is complex and not well studied. Among the major problems encountered in defining its structure are:

- **Problems in defining what is and is not a journal.** There is little agreement on what characteristics a journal should have. How frequently is the "journal" published? Is it peer-reviewed? Does it contain accounts of original research, review articles, or applications? Is it designed to be stored and indexed, or to be read and discarded (the so-called "throw-away" journals)?

- **Problems in defining what to include under the title of "medical."** Do nursing, environmental health or psychotherapy qualify as "medical?" Do topics of basic research with medical applications qualify?

- **Problems in researching the industry.** Should English-language journals published abroad be included? Should foreign-language journals be considered? How can the importance of a journal be determined? What are the criteria for cost-effectiveness in the production, distribution and referencing of biomedical information?

- **Variation in the characteristics of publishers.** Is the journal

published for profit or for professional reasons? How many titles and related documents does the publisher publish? How much does the journal depend on advertising? What are the editorial policies? Is it produced by part-time, voluntary staff? Does the journal cater to individuals or to libraries?

The implications of the above questions are that the scientific journal publishing industry is characterized by a large number of units of analysis that vary widely on a great number of qualitative and quantitative dimensions. In addition, the topic as a whole has not received much attention from researchers. In fact, much of the data that would assist in this research is apparently not collected, reported or compiled into useful forms.

What Constitutes a Medical Journal?

A major problem for librarians and researchers in the field of scientific communications is the lack of clear definitions and reporting categories for the variety of documents involved. Consider the similarities and differences among the following documents: serials, periodicals, magazines, journals, newspapers, monographs, annual reports, yearbooks, proceedings and transactions. Most data reported for serials or periodicals include data on journals, as well as on a host of other types of publications that have little in common with scientific journals.

The American Library Association distinguishes between serials and periodicals (numbered serials), but not journals.[1] The association defines a periodical as "...a serial publication that constitutes one issue in a continuous series under the same title, usually published at regular intervals over an indefinate period, individual issues in the series being numbered consecutively or each issue being dated." Included here are newspapers, magazines, newsletters and other publications in addition to scientific journals.

Machlup and Leeson[2] conducted a major study for the National Science Foundation and the National Endowment for the Humanities titled "Information Through the Printed Word: Dissemination of Scholarly, Scientific and Intellectual Knowledge." They never identified a reliable definition of a journal. They did develop a classification of some usefulness, however. They classified their sample into four types of journals:

1. **Nonscholarly journals** containing general information for intelligent and well informed readers.

2. **Learned journals** containing scholarly material in the classical sense and having national or international appeal. These journals were further divided into *primary research journals* containing accounts of current, original research and *secondary research journals* containing reviews, abstracts, literature surveys and other derivative material.

3. **Practical professionl journals** containing applied information of national or international appeal.

4. **Parochial journals,** which could be placed in any of the other categories, except for the fact that they appeal exclusively to narrow groups of readers defined by geography or other restrictions, e.g., the Missouri Medical Association Bulletin.

This taxonomy, while useful, is not ideal. Many nonscholarly journals, for example, come perilously close to being magazines, and the *New England Journal of Medicine,* which is a regional journal, might be a parochial journal if not for its superlative reputation. Also, most data on periodicals are not reported in these categories.

As a result of the ambiguity of what constitutes a journal, we do not even have an accurate estimate of the total number of scientific and technical journals. The Bowker data base lists 69,000 periodicals from 63,000 publishers in 196 countries. *Ulrich's International Periodicals Directory*[3], a subset of the Bowker data base, lists 34,500 periodicals. Also published by Ulrich's is a supplemental directory of irregular serials and annuals. The supplement is updated quarterly and adds some 1,500 entries with each issue.

Machlup and Leeson[2] in 1978 reported estimates of between 5,000 and 100,000 science and technology journals currently in publication. (The authors do not say if the number includes international and foreign journals.) Another often cited estimate is that provided by Fry and White[4], who list the figure as 2,459 (domestic) journals. These figures illustrate the problems created by different definitions of "journal."

A second major problem is that data on periodicals are often broken down only into general topical headings. It is not uncommon for medical journals to be included under life sciences or health sciences, which makes identifying the number of medical journals impossible. Even the topic of "medical" presents problems, not only in distinguishing between basic and applied research journals but in distinguishing between "primary" and "adjunct" topics. For example, journals of nursing, environmental health, clinical psychology, medical economics and so on may or may not be categorized as medical journals.

Despite the vagaries of definition and reporting categories, some researchers have estimated the

number of biomedical journals. Morgan[5] reports that there are approximately 20,000 medical journals, about 3 percent (600) of which go out of publication each year, to be replaced by an equal number of new journals. He also mentions that the National Library of Medicine indexes only 3,200 titles; new titles are added only as others are dropped. While this figure is not an estimate of the number of medical journals, it probably includes the most important domestic and foreign publications.

Ulrich's International Periodicals Directory[3] classifies entries under 557 subjects, including "medical science," which contains an estimated 4,900 foreign and domestic titles. The *Journal Citation Reports*[6] compiled by the Science Citation Index breaks down medical journals into at least 41 different subheadings that include 1,353 foreign and domestic titles. This estimate could vary widely depending on whether one includes the 40 titles for "public health" or if one excludes the 36 titles under "research and experimental medicine."

Assessing the Scholarly Importance of a Journal

Several indicators provide rough measures of "scholarly importance" by which journals can be judged. These indicators include:[1,6,7]

- The number of articles published by a journal each year;
- The number of cited articles published by a journal each year (the number of "source items" published);
- The impact factor (a ratio between the number of articles cited within two years of publication and the number of articles published). A high impact factor indicates that the journal is publishing many articles important enough to be cited in subsequent publications. An impact factor of 15.9, for example, indicates that about 16 percent of the articles published by the journal are cited in other articles within two years;
- The total number of citations for articles published by a journal in a year (a measure of how many important articles are published);
- The immediacy index (a measure of how quickly the "average article" in a particular journal is cited after original publication); and
- Cited half-life value (the number of years, from the current year going back, in which 50 percent of a journal's articles cited in the current year were originally published). A short half-life may indicate that recent articles in the journal are being cited often, which implies their intellectual importance to the field; a long half-life can indicate the journal is publishing landmark articles with profound impact on the field.

These criteria can be used to designate the relative importance of journals. For example, of the 79 general medical journals listed in *Journal Citation Reports*[6], the five that usually have the highest ratings on these and other criteria are: the *New England Journal of Medicine* (NEJM) published by the Massachusets Medical Society; the *Journal of the American Medical Association* (JAMA), published by the American Medical Association; the *British Medical Journal* (BMJ), published by the British Medical Association; the *Annals of Internal Medicine* (AIM), published by the American College of Physicians, and *Lancet*, published by Lancet, Ltd., in London. Values of these criteria for the leading journals are shown in Table 1.

Table 1. The Five Leading General Medical Journals As Determined By Impact Factor, Citations Received, Immediacy Index and Cited Half-life (1986 Data)

Journal	Impact Factor	Citations Received	Immediacy (yr)	Half-life (yr)
NEJM	15.921	58,308	3.764	5.6
Lancet	9.444	58,847	3.744	6.0
AIM	8.2111	22,029	2.011	5.8
JAMA	(3.804)*	24,555	1.113	8.5
BMJ	(2.804)*	30,329	1.964	6.8

*The World Health Organization's *Technical Report Series* and *Medicine* are the forth and fifth ranked, respectively; JAMA and BMJ are the seventh and ninth, respectively.

Ranking journals by the number of source items published favors larger journals and journals with more frequent publication. By this criterion, NEJM and AIM are second and forth, respectively. Two other regional medical journals (NEJM is a regional journal), the *Southern Medical Journal* and the *Western Journal of Medicine,* rank first and fifth. The *Archives of Internal Medicine* ranks third.

(Incidentally, four of the five

leading journals are among the oldest of medical journals. The NEJM, founded in 1812, is the oldest medical journal. Its establishment was followed in England by *Lancet* in 1823 and by the BMJ in 1832; JAMA was begun shortly thereafter, in 1848. *Annals* did not appear until 1927. Thus, most of these journals have had long histories, during which they established many of the editorial and economic practices of medical journals.)

Selecting Articles for Publication

The most important considerations in selecting articles for publication are: 1) to provide the highest quality of current medical information and, in so doing, 2) to build or maintain the credibility and reputation of the journal.

The **exclusionary rule**, also called the Inglefinger-Rellman rule after the two NEJM editors who established it as a norm, states that articles will be reviewed "...with the understanding that neither the substance of the article nor the figures or tables have been published or will be submitted for publication elsewhere...."[8] The rule was created in response to "abuses by tabloids and some representatives of the general press."[9] Thus, the norm has been established that "...publication in a peer-reviewed journal marks the beginning of an ongoing dialogue within the medical community."[9]

Peer review is the process by which an article is evaluated by experts in the field, who then recommend that it be published, revised or rejected. It is a gatekeeping process that affects whether, where and in what form an article will be published. The principle is widely held to be an important element in maintaining good science—it is regarded by many as the "heart of the publication process."[10]

However, many studies of peer review show that it is little better than chance in determining which articles will be published in a given journal.[10,11,12,13] Too, one of the leading primary medical journals, *Lancet*, did not use peer review until just recently, and many of the more valuable "throw-away" journals that fit under the practical professional heading also do without peer review.

Even when peer review is successful for a given journal (for example, see Stephen Lock's discussion of peer review for the BMJ[11],) for the industry as a whole it is apparent that "...there are scarcely any bars to eventual publication.... Most rejected articles are eventually published elsewhere."[14] Thus, peer review may function more to determine *where* an article is published than *whether* it is published.

Authors generally submit articles to the most prestigious journal in their field. If the article is rejected, it will usually be submitted to the next most prestigious, and so on. In one study of family practice, physician-authors Whitman and Eyre[15] found that 11 percent of articles published in 8 journals of interest to family practitioners had first been rejected by NEJM. In fact, a clear pattern emerged of submitting first to NEJM, then to JAMA, AIM, and *Lancet* (BMJ was not included in the study). The percentage of the articles published without prior rejection by other journals was 89 percent for NEJM; 71 percent for *Lancet*, 70 percent for AIM; and 68 percent for JAMA. Although an article can be rejected for a number of legitimate reasons (outside the scope of the journal; improper length, improper documentation, poor editing, not timely and so on), it appears that there is a pecking order for journals that has important implications for authors and for science.

Peer review is fraught with difficult issues, including its effectiveness in differentiating between strong and weak articles; its effect on the final form of the published article, especially for articles submitted to several journals in sequence; its cost; and its reliability among reviewers. In response to a growing concern about these and other issues about peer review, the American Medical Association is sponsoring in 1989 an International Congress on Peer Review in Biomedical Publication.

The Economics of Publishing a Journal

"Deciding whether to start a journal or, alternatively, assuming the responsibility from a professional society for publishing its journal, is handled in the same manner as a proposal for a new book, but the stakes are higher."[16]

"It is easier to talk someone out of committing suicide than out of starting a new journal."[5]

Journal publishers usually fall into one of four general categories:[2]

1. **Commercial publishing firms** (who also publish books);
2. **Professional societies;**
3. **Other not-for-profit firms** (e.g., research laboratories, foundations, religious and political organizations); and
4. **University presses.**

The diversity of factors affecting these categories, as well as individual publishers within each category, is great. Whatever the diversity, however, most journals face two major problems: maintaining their economic health and maintaining a high standard of scientific quality.

The economic health of medical journals is affected by several factors:

- The general expansion of science and the corresponding increase in the number of

manuscripts submitted for publication.

- Increases in the number of subspecialty and "throw-away" journals that compete for advertising money (and for physicians' reading time).
- Increases in production and distribution costs.
- Decreases in library budgets and, hence, in library subscriptions, which constitute a large portion of journal income.[17]

These problems are encountered differently by different categories of publishers. As the vice president of a major scientific publishing house described it:

> You approach a scientific area this way: you try to set up a primary journal first, then begin publishing advances, reviews, serial, or continuation lines. Then you bring out a multivolume state of the art. After all this, a monograph series can be spun off. Then you tie it in with a reprint line, particularly if the reprints in this area date back before 1900 and are in the public domain. At the end of each year, our journal subscriptions bring in hundreds of thousands of dollars of income, on which we don't have to deliver any goods immediately. The orders for the serial publications build up in advance. We have large standing orders for many of our books. We try to send our promotion mailings prior to publication, and then we get a number of advance orders. We can use our journals to advertise our books. It's a very effective program....[16]

Also, however:

> It would look bad if we stopped publishing a journal even if it was unprofitable. Even though we can't count its profitability in pennies, journals bring in and maintain a clientele. They are often very prestigious. By no means would we ever quit doing [a journal]. That could be a fatal mistake.[16]

Although general medical journals are "very profitable," the editorial and printing costs of producing them are much higher than those of specialty journals.[5] The broader the journal's scope, the harder it is for the editor to keep up with advances and contacts in rapidly changing fields. For example, AIM maintains a list of 5,500 reviewers for its articles.[7] Keeping this list current and tracking dozens of manuscripts through multiple reviewers is a costly and time-consuming task.

'Although general medical journals are "very profitable," the editorial and printing costs of producing them are much higher than those of specialty journals.'

Several indicators could be used to evaluate the economic characteristics of scientific journals, if they could be obtained:

- Annual budget.
- Size of the circulation/subscription audience.
- Number of journal pages printed per year (including advertising space).
- Size of advertising revenues.

Unfortunately, it appears that these data are not systematically collected, reported or compiled. *Ulrich's*[3] does provide circulation figures for domestic journals. (For the five leading general medical journals-the circulation figures for 1986 were: JAMA, 279,000; NEJM, 215,000; AIM, 91,000; *Lancet*, 42,306; BMJ, not available.) The variation among categories of publishers is undoubtedly a factor in this absence of information.

The Market for Medical Journals

The market for medical journals, including general medical journals, consists of two main components: libraries and individuals.[1] Subscription rates differ for these two markets. Libraries typically pay much larger rates because their readership is obviously larger and because they offer opportunities for inter-library loan and extensive photocopying, both of which are believed to reduce subscriptions by individuals.[1] Individual subscribers are usually physicians who are members of the professional society: the subscription is included in annual dues.

Library and institutional subscriptions are important sources of revenue for many scientific journals. Institutional subscribers tend to tolerate price increases better than do individual subscribers,[2] and they tend to drop subscriptions only when faced with budget cuts.[17]

An interesting problem here is that many libraries order journals from subscription services, such as F.W. Faxon Co., Inc. and EBSCO.[17] Such services help libraries reduce the paperwork of ordering and paying for subscriptions. The services also may play an important part in selecting which journals a library orders, either by supplying the library with a "package" of journal titles, or by their decision to carry or not carry a particular title or a particular publisher. The implication is that journals must consider marketing to subscription services as well as to individual libraries.

The F.W. Faxon Co., Inc. produces the *Librarian's Guide to Journals*, which lists the journals they market, as well as advertisements for these journals.[18] The company has a Medical Information Services Division specifically set up to handle medical school, hospital and

research libraries. An Academic Information Service assists university libraries in the development of their collections. Contacting these divisions and other subscription services is important in marketing a journal.

Other types of journals have developed different markets with different economics. The "throwaway" or "tabloid" journals depend almost exclusively on advertising, usually from pharmaceutical or medical devices companies. These "journals" vary greatly in quality and usefulness, are widely read, are often free, and address physicians not so much by their role as therapist or scientist but by their roles as businesspeople in private practice ("medical cookbookery journals"), travelers to professional meetings ("glorified travel magazines"), or faculty who need to publish ("loose-leaf cumulations published more quickly than books and with more authority than review articles").[19] The tabloids offer material that is "...usually timely but often transitory."[9]

In addition to market forces and competition from tabloids, general medical journals must compete with a large number of specialty and subspecialty journals for advertising money and physician reading time.[20]

Advertising in Medical Journals

> It is a strange paradox that both the publishers of scientific journals and their prospective advertisers see space advertising as a necessary evil. The editors of the journal reluctantly accept it because it ultimately becomes necessary for the existence of the journal, and the advertiser resists buying it because he is never really convinced that it pays off in terms of product sales. Both exhibit a considerable amount of naivety about the objectives of the other, a fact that makes the whole procedure extremely difficult.[17]

'The medical community fears that the influence of special-interest groups, primarily the pharmaceutical and medical device manufacturing industries, will bias and perhaps exploit medical science.'

Advertising in scientific journals is a touchy subject. The medical community fears that the influence of special-interest groups, primarily the pharmaceutical and medical device manufacturing industries, will bias and perhaps exploit medical science. And, in fact, many pharmaceutical companies push to have the research findings of a new drug published in a journal: it is free advertising, and it helps legitimize the drug. Advertisers then advertise the drug in the same issue. The practice has resulted in "articles" that are actually poorly disguised promotions for the proprietary drug that is advertised on the next page, so to speak. To prevent this practice, and to avoid the risk of "promoting" a product, most journals that accept advertising have a policy similar to that of the publishers of *Postgraduate Medicine.* Their policy reads: "By long-standing tradition, *Postgraduate Medicine* does not place adjacent to editorial or advertising material, advertising that relates to the same or similar subject...."

Advertisers, for their part, realize that, although medical journals can target their markets effectively, several other factors make advertising in these journals less desirable. Library and student subscribers, for example, which comprise a large percentage of subscribers in many journals, are of no interest to advertisers and, in fact, are considered to be liabilities. Other characteristics of journals are also of concern to advertisers.[17] Among these characteristics are:

- Journals are often "thinner" than preferred (advertisers view "thickness" as a sign of success);
- Publishers may not provide an audit statement;
- Journals are often drab and unattractive;
- Journals may not be published frequently enough to carry timely advertisements;
- Journals may not carry enough editorial matter to maintain the preferred editorial-to-advertising ratio of 50:50; and
- Journals provide relatively poor market research information to advertisers.

Several of these characteristics could be addressed by journals to increase their advertising revenues. For example, many journals "bunch" advertisements at the beginning or end of the journal, rather than distribute them throughout the pages where readers will encounter them in the course of scanning the articles. The NEJM places all advertisements in the first 50 pages and in the last 50 pages of each issue. The remaining 50 pages in the middle are the journal proper. These pages can be read and photocopied without the distraction of advertising. (It should also be said that NEJM has a long and distinguished reputation that probably allows it to dictate to its advertisers more than other journals can dictate to their advertisers.)

The more frequently published journals, such as NEJM, can carry classified ads from individuals. Many journals also rent their mailing lists, although some give subscribers the option of having their names removed from the rented list.

All the above reasons contributed to the development of "controlled

free-circulation journals" (the "throwaways"). These journals, considered by many to be scientifically irresponsible[17], differ from scholarly journals in that their primary objective is to sell advertising. As a result, they are much more flexible in responding to the wishes of advertising. As a group, these journals attract about 80 percent of the advertising sales market.[17] Biomedical journals should be able to attract some of these dollars with intelligent planning. □

Manuscripts Wanted

If you've been considering a topic for a possible future article in the *AMWA Journal,* don't delay. We're always looking for new, fresh ideas. If you have an idea that you believe might be relevant to the *AMWA Journal,* contact the Editor-in-Chief, for more information.

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AMWA News

Dr. Brazelton Named McGovern Medal Recipient

T. Berry Brazelton, M.D., will receive the prestigious John P. McGovern Medal — one of the highest honors that AMWA can bestow on an individual in medical communications — at the upcoming Annual Conference in Boston. Dr. Brazelton, host of Lifetime's popular child-rearing program "What Every Baby Knows," is Clinical Professor of Pediatrics at Harvard Medical School and founder and retired Chief of the Child Development Unit at Boston's Children's Hospital Medical Center.

Dr. Brazelton will receive the award at a luncheon ceremony on Thursday, Nov. 16.

Dr. Brazelton has authored more than 150 articles and 15 books on child development, including an updated version of his classic *Infants and Mothers,* which has been translated into 16 languages, and the popular *Working and Caring,* which offers sound advice for working parents on raising children in the 1980s.

One of Dr. Brazelton's foremost achievements in pediatrics was the creation of the Brazelton Neonatal Behavioral Assessment Scale, which he began devising more than 30 years ago. Commonly known as "the Brazelton," this landmark procedure is now used worldwide to test not only the physical and neurological responses of newborns, but more importantly the psychological well-being and individual differences between babies at birth.

Dr. Brazelton

Dr. Brazelton, who *Time* magazine calls "the new Dr. Spock," received his B.A. degree from Princeton University in 1940 and attended Columbia University School of Medicine. After graduating from medical school in 1943, he accepted a medical internship at New York's Roosevelt Hospital. In 1945 Dr. Brazelton moved to Boston to serve as medical resident at Massachusetts General Hospital before undertaking pediatric training at Boston's Children's Hospital Medical Center. Dr. Brazelton's interest in child development then led to training in child psychiatry at Massachusetts General Hospital and James Jackson Putnam Children's Center from 1947-50. Dr. Brazelton integrated his psychiatric training into the private practice of primary care pediatrics, a practice he continues today.

And what about his own children? Did the physician who has examined more than 30,000 babies in his career heed his own child-rearing advice? Dr. Brazelton gets off the hook this way: "You'd have to ask my kids. Parenting is too personal to be intellectual."□

(Photo courtesy of the National Library of Medicine)

Patent Medicines To Be Explored

A lecture titled "Public Pharmacology: Patent Medicines and How They Worked" will be offered by J. Worth Estes, M.D., during the Nov. 16 General Session at the Annual Conference in Boston.

Dr. Estes is Professor of Pharmacology (History of Pharmacology) and Associate Professor of Socio-Medical Sciences at the Boston University School of Medicine. The author of several books and numerous articles in the medical literature, Dr. Estes is a recognized authority in the history of pharmacology.

Dr. Estes earned his M.D. from the Boston University School of Medicine in 1964. He also holds an M.A. degree in pharmacology from the Boston University Graduate School and an A.B. degree from Harvard College. He served an NIH Fellowship in Clinical Hematology at University Hospital in Boston and an NIH Fellowship in Hematology at the Clinical Genetics Research Unit, University of London, and the Hospital for Sick Children in London.

Dr. Estes is the author of *Hall Jackson and the Purple Foxgloves: Medical Practice and Research in Revolutionary America, 1760-1820, The Changing Humors of Portsmouth: the Medical Biography of an American Town, 1623-1983,* and *The Medical Skills of Ancient Egypt.* □

William Harvey Award Recipients Announced

The recipients of the William Harvey Awards for excellence in the reporting of hypertension have been announced. The program is sponsored by AMWA, the National High Blood Pressure Education Program and the Squibb Corporation.

The recipients of the awards are:

Newspaper competition

First — Robin Marantz Henig, *New York Times Magazine,* "Defining Hypertension," Jan. 24, 1988

Second — Gina Kolata, *The New York Times,* "Costly New Medications Overtake Diuretics in Treating Blood Pressure," April 14, 1988

Third — Jamie Talan, *New York Newsday,* "White-Coat Hypertension, From Fear of the Doctor," Jan. 15, 1988

Honorable Mention — Dennis L. Breo, *Chicago Tribune Sunday Magazine,* "Could Anyone Have Saved Mayor Washington's Life?" March 20, 1988

Magazine competition

First — Jeff Schein, *Consumers Research,* "Diet and High Blood Pressure," January 1989

Second — Britain Nicholson, M.D., Harvard Medical School *Health Letter,* (2-part series) "High Blood Pressure: A New Look," December 1988, and "High Blood Pressure: Newer Treatments," January 1989

Third — Janis Graham, *Self,* "Pressure Points: Surprising News about Blood Pressure, Aimed Straight at the Heart," January 1989

Honorable Mention — Dalton Narine, *Ebony,* "Heart Disease: How to Beat the No. 1 Killer of Blacks," June 1988

Radio competition

First — Jeff McKinney, *Medical Journal Radio Network,* "Side-Effects of Hypertension Medications," Dec. 1-3, 1988

Second — Nanci McGraw, KYXY-FM Radio, San Diego, California, (4-part series), "High Time to Know about Hypertension," December 1988

Television competition

Third — Julie Slavik Budnik, "High Blood Pressure: A World of Discovery," Emory Medical Television, December 1988

What AMWA Journal Readers Say

Following are some of the comments received from readers of the *AMWA Journal* in the recent editorial evaluation:

*"Could you use the **AMWA Journal** to develop some of the courses in your Core program? I never get a chance to go to your conferences and miss out on your Core Curriculum courses."*

"I'm interested in seeing more ways of communicating medical information to patients and consumers. That is my business! Also, more editorial hints, i.e., how to refine a query letter."

"I'd like to see more of the things Edie Schwager writes about."

*"I read the **AMWA Journal** almost exclusively to get information that helps me do my job better! I'd like to see fewer 'literary forum' types of reflective or personal experience articles. They're good, and I think they deserve to be published someplace, but I don't think they generally are most appropriate for a journal with our audience."*

"News capsules are well done, but rather dated and not at all useful."

*"I love the **AMWA Journal** and read every page! I find it useful and informative!"*

*"The **AMWA Journal** is much easier and more enjoyable to read than its predecessor. I would like to see more 'how to' articles, such as the patient education materials and grant proposal articles. Also interesting would be a profile on a person in a specialized area of medical communications."*

*"You were better off with a newsletter. The **AMWA Journal** is/remains chatty, a mistake since I expect a journal to contain original, professional information. Original articles read more like advertisements than journal articles."*

*"I enjoy reading letters to the editor. Overall, the **AMWA Journal** is a vast improvement over previous format."*

"I object to articles that stray from the purview of a professional journal, e.g., the editor's recent article on alcoholism. I understand his desire to inform, but surely he could have found a more appropriate forum for doing so. This journal seems often to include writing from a personal slant that I judge inappropriate (and more to the point, uninteresting). As a professional, I expect writing about 'hard stuff'—informative material applicable to my work, not my personal concerns."

"I'd like to see an alternative to features that try to be 'journal papers,' laden with references and written in 'textbookese.'"

"Overall, it's excellent."

Five Members to Receive AMWA Fellowships

Five members of AMWA will be awarded Active Fellowships during the Annual Conference in Boston. They include:

- *Michael F. Bruckner.* A former president of the Greater Chicago Chapter (1982-83), Mr. Bruckner has presented numerous workshops at the Annual Conference and for various AMWA chapters. He also has served as a moderator and panelist for several panel presentations at the Annual Conference. He has been active in the Mid-Year Section Program, serving as a Networking Luncheon Table Leader (1983, 1985). In 1988 he produced the Workshop Leaders Instruction Tape.
- *Leo R. Maestripieri.* A member of the Metropolitan New York Chapter, Mr. Maestripieri has served as Administrator of the Department of Awards, Chair of the Allied Health Book Awards Committee and member of the Fellowship Committee. He has served as Chair of the Pharmaceutical Section Plenary Session at the Annual Conference (1985-86) and as chair of the Pharmaceutical Section Breakfast (1985). In 1988 he developed the AMWA Awards Handbook.
- *Ronald J. Sanchez.* A former president of the Mid-Atlantic Chapter, Mr. Sanchez has served as Editor-in-Chief of the *AMWA Journal* since its inception in 1986; he authors the regular editorial column "One More Idea" that appears in the publication. He previously served as Editor of the *AMWA Newsletter* (1985-86) and as a member of the Nominating Committee. He also has served as a Networking Luncheon Table Leader at the Annual Conference (1986).
- *Elizabeth S. Stone.* Ms. Stone has served as president (1985-87) and as secretary of the Pacific Southwest Chapter. She also has served as the Chair of the Editors Section Plenary Session at the Annual Conference (1987), a Network Luncheon Table Leader (1984) and a workshop leader (1985). Ms. Stone also has served as Chair of the AMWA Constitution and Bylaws Committee (1985-86) and as a judge for the book awards competition. She also has served as Program Chair for the Asilomar conference.
- *J. Eugene White.* Mr. White has served as Administrator of the Department of Publications (1988-89) and the Department of Annual Conference (1987-88). In addition, he has served as Chair of the Public Relations Plenary Session for the Annual Conference (1986), Annual Conference Program Chair (1988), a Networking Luncheon Table Leader (1988), moderator for the Public Relations Plenary Session (1987) and a workshop leader (1984-85). He also has served as Core Curriculum Workshop Coordinator (1986-87).□

Mr. Bruckner

Mr. Maestripieri

1989 Fellows

Mr. Sanchez

Ms. Stone

Mr. White

Forums Slated for Annual Conference

- *"Desktop Publishing"*
  Wednesday, Nov. 15, 2-5 p.m.
  Moderator: Bill Brooks

- *Paper Presentations: "Medical Priorities: Messages of the '90's"*
  Thursday, Nov. 16, 2-5 p.m.
  Moderator: Lynn Alperin

- *"State/Small Journal Editors"*
  Friday, Nov. 17, 2-4 p.m.
  Moderator: Jordan Burkey, M.D.

- *"Medical Marketing: The Age of Accountability"*
  Saturday, Nov. 18, 10 a.m.-noon
  Moderator: Joel Tau

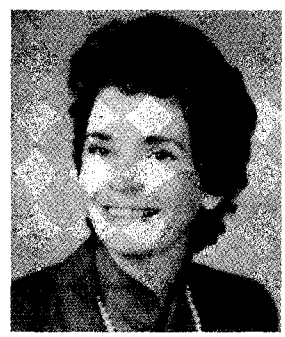
- *"Career Development"*
  Saturday, Nov. 18, 9-11 a.m.
  Moderator: Richard Bell Smith

- *Education: "Medical Communication in Higher Education—Programs and Possibilities"*
  Saturday, Nov. 18, 2-4 p.m.
  Moderator: Doug Haneline, Ph.D.

1989-90 Slate of Nominees for National Office Announced

At its April 7 meeting in Arlington, VA, the Board of Directors approved the following slate of nominees for 1989-90:

Ms. Robie



Ms. Smith

Dr. Hodgson

President-Elect: (President for 1990-91) Pat Robie

An AMWA member since 1975 and a Fellow of AMWA (1986), Ms. Robie is currently serving as Secretary of AMWA and as Administrator of the Department of Membership. Before that she was Vice President and Administrator of the Department of Publications (1986-87) and Chair of the San Francisco Annual Conference (1985-86). In 1984 she was the local arrangements chair for the San Antonio Annual Conference, and in 1985 she was Workshop Coordinator for the Montreal Annual Conference. While serving in this capacity, she devised an evaluation system for ranking workshops at that conference that was proven to be an invaluable tool in measuring the quality of AMWA workshops. Ms. Robie was a member of the Long-Range Planning Committee in 1986.

Ms. Robie has long been active in the Southwest Chapter, beginning in 1982, when she was on a committee to revitalize the chapter. She was chapter treasurer from 1982-84 and chapter president in 1985-86. She continues to serve as the production editor of the chapter newsletter, a position she has held since 1982, and she also has been the chapter membership chair since 1986. In addition, in 1983, she co-chaired the first Southwest miniconference, a forerunner of AMWA's current regional conferences.

At Houston's St. Joseph Hospital, Ms. Robie has served as Editor of the *Houston Medical Journal* and as the Senior Medical Editor. She was Assistant Director of the PR Department at St. Joseph Hospital until 1984. Ms. Robie is currently editor of *Houston Medicine* and employed by the HCA Woman's Hospital of Texas.

Secretary: Elizabeth Smith

Ms. Smith has been a member of AMWA since 1980 and was awarded Fellowship in 1988. She is currently serving on the Executive Committee as Administrator of Sections, a position that she also held in 1987-88. She is currently serving as President of the Delaware Valley Chapter. Ms. Smith has served the Delaware Valley Chapter as Treasurer, Workshop Coordinator and delegate to the national Board of Directors. She has developed programs for chapter meetings and participated in local programs as both workshop leader and panelist.

Ms. Smith has co-produced the Audiovisual Core Curriculum workshop, "Scriptwriting for Film and Video," and has led the workshop frequently since 1983. She has been a panelist for several other workshops given at annual conferences and will be a panelist for the Freelance Section Plenary Session in Boston.

The Smiths have their own company, Smith Simon Company, which provides writing services in all media for both general and special markets. Ms. Smith is also involved with her own company, Medslide Inc., which is producing a series of videopresentations on Downs Syndrome and audio/workbook programs on cancer prevention.

Treasurer: Helen Hodgson, Ph.D.

An AMWA member since 1983, Ms. Hodgson is currently serving on the Executive Committee as the Administrator of the Department of the Annual Conference. She chaired the paper presentation sessions at the 1987 and 1988 annual conferences and served on both the Nominating and Budget and Finance committees in 1987-88. She has presented a workshop on writing style at several annual conferences. Her appointment as New Member Delegate to the Board of Directors in 1983 led to her involvement in AMWA at the national level.

Ms. Hodgson became committed to establishing the Rocky Mountain Chapter in 1983 and saw that become a reality in 1985. She has been chapter delegate to the board since the chapter's inception and served as chapter president in 1987-88.

Ms. Hodgson is President of Health/Life Planning, an innovative educational and research corporation committed to resolving conflicts in the field of medicine through a new understanding of physician leadership and effective medical team interactions. Materials that she has been instrumental in creating over the past several years have formed the basis for a 3-½ day seminar titled "Caring for Difficult Patients," which she now teaches about once a month.

According to the AMWA Bylaws (Article II.1.b), any member in good standing may submit additional nominations for these three offices, provided the nominations are sent in writing to the Secretary at least 30 days before the Annual Business Meeting. This year's Business Meeting will be held at the Boston Annual Conference on Friday, Nov. 17.

Such nominations must state clearly the qualifications of the candidate, they must be signed by at least 10 members in good standing and they must be accompanied by a letter from the candidate stating that he or she will serve if elected. □

Expanded Core Curriculum to be Introduced in Boston

For a decade, the Core Curriculum program of continuing professional education in biomedical communications has earned high praise from AMWA members and has been the envy of other professional associations. Now, the Core Curriculum has been expanded to provide new opportunities for professional enrichment and education. The expanded Core program will be initiated at the 1989 Annual Conference in Boston, Nov. 15-19.

A Brief History. AMWA visionaries shaped the Core Curriculum in the late 1970s. Four courses—Scope of Medical Communications, English Usage and Abusage, Organizing the Medical Paper and Introduction to Medical Public Relations—earned Core credit for the first time in 1979 at the Kansas City Annual Conference. As President Byron Scott wrote in the annual conference program, "At this meeting we inaugurate the Core Curriculum, a project brewing among AMWA's leadership for years.... It may be the most important addition to our meetings since we initiated workshops in the late 1960s."

The following year, at the 1980 Annual Conference, 18 Core courses were offered, and during the next eight years, 42 courses were developed and put through the rigorous approval system that qualified them as part of the Core program. Over the past decade, Core courses have been fine-tuned, polished and offered at least 350 times at annual conferences and another 100 times at chapter, section, regional and outside meetings.

Workshop planners have traditionally given preference to Core workshops at annual conferences to assure maximum availability. A Department of Regional Meetings has been established to administer a regular series of Core programs at selected locations around the country, providing greater access to the Core program.

The Expanded Core Curriculum. Here's what the Expanded Core Curriculum looks like. There will be 6 to 12 required courses (formerly called "Trunk" courses) and 45 to 50 elective courses in the specialty areas of audiovisual, editing, freelance, pharmaceutical and public relations/advertising/marketing (PRAM for short). What formerly was public relations will be expanded to include courses that will address the needs of people in advertising and marketing as well. Many "Stem" courses from the established Core Curriculum will be retained, and useful new workshops will be added as elective courses.

Registrants will have the opportunity to earn two types of certificiates:

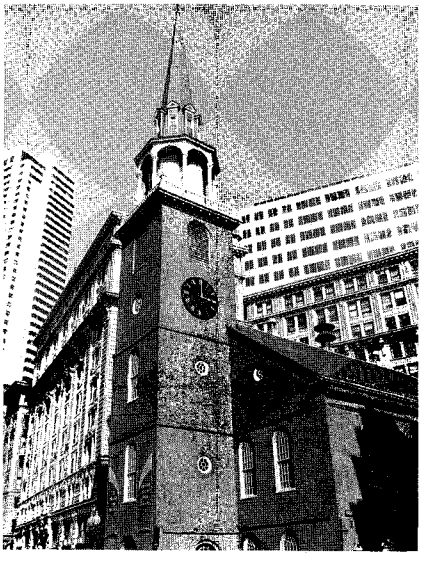
CROSS-DISCIPLINARY: 4 required courses plus 4 elective (specialty) courses selected from any combination of specialty courses. No special interest area will be identified on the certificate.

SPECIALTY: 4 required courses, plus 4 elective courses from a single specialty area (all, say, in pharmaceutical or editing). The certificate so earned will name the specialty.

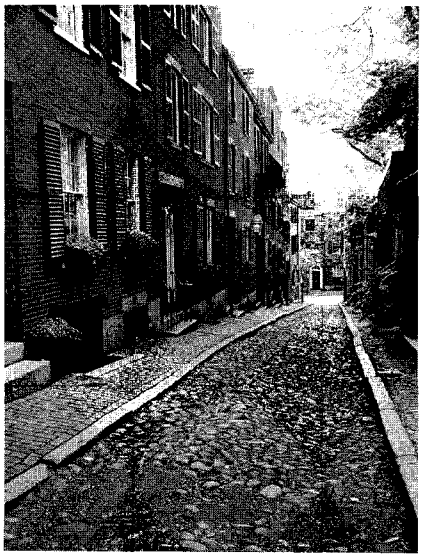
A person may earn a second certificate by paying a second matriculation fee and completing an additional 4 courses in a specialty area, and may earn a third certificate by paying a third matriculation fee and completing 4 more courses in yet another specialty area. The opportunity to earn additional Core certificates will be welcome to those biomedical communicators with diverse responsibilities and skills and those with employers who make Core credit a contingency in reimbursement for AMWA meeting expenses.

Another benefit of the new program is that some courses will carry credit for more than one specialty area. An example would be "Preparing the Clincial Summary of an NDA," which could be applied to either a pharmaceutical certificate or an editing certificate. "Working with a Medical Illustrator" could be applied to any of three certificates—editing, audiovisual or freelance.

The listing on the next page is a partial list of courses in the Expanded Core Curriculum.□



Boston's Old South Meeting Place



Beacon Hill in Boston

Core Curriculum Courses

REQUIRED (RE)

RE	Scope of Medical Communications
RE	Usage and Abusage
RE	Bibliographic Resources for Medical Communications
RE	Tables and Graphs
RE	Sentence Structure and Patterns
RE	Basics of Punctuation

ELECTIVE

AUDIOVISUAL (AV)	
AV	Audiovisual Alternatives in Medical Communications
AV	Slide-Tape Programs
AV	Instructional Writing for Audiovisual Media
AV/ED	Making Effective Slides
AV/ED	Scriptwriting for Films and Videotapes

EDITING (ED)	
ED	Effective Paragraphing
ED	Writing Abstracts
ED	The Organization of the Biomedical Paper
ED	Biomedical Manuscriptions Other Than Journal Articles
ED	Proofreading
ED	How to Train, Supervise and Evaluate Copyeditors
ED	Outlining for Writers and Editors
ED/AV/FL	Working with a Medical Illustrator
ED/FL	The Author-Editor Relationship
ED/FL	Copyright Law

FREELANCE (FL)	
FL	Launching a Freelance Career
FL	Business Aspects of a Freelance Career
FL	Effective Interviewing Techniques
FL	Marketing Your Manuscript
FL/ED	Medical Writing for Magazines
FL/ED	Writing a Book Proposal

PHARMACEUTICAL (PH)	
PH	Introduction to the Drug Regulatory Process
PH	Writing Clinical Study Protocols
PH	Preparing IND Applications
PH	Packaging Inserts
PH/AV	Scientific Exhibits and Posters
PH/ED	Preparing the Clinical Summary of an NDA
PH/ED	Preparing the Nonclinical Section of an NDA
PH/ED	Drug Monographs
PH/ED	Publications Office at a Pharmaceutical Company
PH/ED	Final Clinical Study Report
PH/FL	Writing Patient Education Literature
PH/PRAM	Pharmaceutical Advertising

PUBLIC RELATIONS/ADVERTISING/MARKETING (PRAM)	
PRAM	Introduction to Medical Public Relations
PRAM	Public Relations Materials and Techniques
PRAM	Broadcast in the Public Relations Mix
PRAM	Product Publicity
PRAM	Issues Management
PRAM	Crisis Management
PRAM/AV/FL	Making Effective Presentations

Forum to Feature Salary Survey Results

As of May 1, more than 730 responses have been received to the 1989 salary survey that was sent to all AMWA members in March. These responses are being tabulated and analyzed by Pat Robie, the AMWA Secretary and Membership Administrator. Results will be presented at the Annual Conference in Boston during the Career Development Forum on Saturday morning, Nov. 18. A complete report of the survey will be published in the *AMWA Journal* after the Annual Conference, and a preliminary report will be available at the forum.

The Career Development Forum is open to all conference registrants at no extra charge. In addition to presentation of the survey results, the forum will feature a panel discussion by four experienced AMWA members on career opportunities in their various specialty areas of medical communications, including the pharmaceutical industry, medical journal publishing, public relations, freelance writing and the audiovisual specialty. □

Be There in Boston

You will soon be receiving the Program Announcement for the AMWA Annual Conference in Boston. The Registration Program for the meeting will be mailed in early August.

Letters to the Editor

WHAT'S IN A NAME?

Dear Editor:

I support your recommendation that medical writers and editors read Randy Shilts' book *And The Band Played On.* I also strongly second your disclaimer concerning the accuracy of some of his more sweeping statements.

In reading your comments, however, I was upset by your use of the phrase "AIDS victims." For several years, people who have been diagnosed with AIDS have consistently fought the image of being identified as "victims." The preferred phrase that has been gaining wider and wider acceptance and has helped to shift the media's, public's and even the medical professionals' image of these people is "people with AIDS" (PWAs).

As a medical writer specializing in immunology, as a resident of San Francisco and as a volunteer for an HIV Day Care Center, I cannot avoid the psychological, personal and philosophical issues of AIDS any more than the clinical.

I was recently informed that people with AIDS is now being replaced by the phrase "people living with AIDS" (PLAs). This change is being made to project an image of people having a chronic disease rather than a necessarily fatal one. Hopefully, this will soon become a clinical reality as well.

In the meantime, medical writers and editors can have an active and influential role in facilitating the usage of the phrase "people living with AIDS" and in supporting the connotations it implies.

Regards,
Marjorie Little
San Francisco

MORE 'PATH TO RECOVERY'

Dear Editor:

I recently read your article on alcoholism and the program of recovery in Alcoholics Anonymous in the Fall 1988 issue of the *AMWA Journal.*

You correctly noted that "Anonymity is one of the principal traditions of Alcoholics Anonymous." Unfortunately, you forgot this principle when you decided to disclose your membership in AA at the public level, using the *AMWA Journal.*

I suggest you review and study the concepts on anonymity. This spiritual principle is so important that two traditions — 11 and 12 — are devoted to its understanding. Basically, these traditions tell us that we are to depend upon attraction rather than promotion to increase our ranks in AA. Also, we may disclose our membership in AA quietly below the level of press, radio, films and television when to do so might do good. We are never to disclose the identity of other members of the program without permission, and we are never to identify ourselves as members of AA at the public level. The spiritual principle tells us that who we are is not important. We are simply alcoholics. Don't forget that beginners are usually very reluctant to let people know they have a problem and like the idea that their membership may remain a secret if they wish.

In the future, please try to be a more viligant guardian of our traditions. Our survival depends upon it.

Sincerely,
Name Withheld Upon Request

SECTION MEETINGS PLANNED FOR BOSTON ANNUAL CONFERENCE

- AUDIOVISUAL SECTION
  Thursday, Nov. 16, 2-4 p.m.
  "Spreading the Message — Live: From Boston"
  Moderator: Lois Gaeta
- EDITORS SECTION
  Friday, Nov. 17, 9-11 a.m.
  "Responsible Medical Communication"
  Moderator: Betty J.B. Cohen, Ph.D.
- FREELANCE SECTION
  Saturday, Nov. 18, 2-4 p.m.
  "Exploring New Markets for Freelance Writers"
  Moderator: Donna Raphael
- PHARMACEUTICAL SECTION
  Friday, Nov. 17, 2-4 p.m.
  "The Challenges of Promise: Biotechnology in the Pharmaceutical Industry"
  Moderator: Michael J. Brennan, Ph.D.
- PUBLIC RELATIONS, ADVERTISING & MARKETING SECTION
  Wednesday, Nov. 15, 2-4 p.m.
  "Easing the Crisis in Crisis Communications"
  Moderator: Ellen Soo Hoo

OBITUARY

William Bennett Bean, M.D., Sir William Osler professor of medicine emeritus at the University of Iowa College of Medicine, died at his home on March 1. Dr. Bean was head of internal medicine at the University of Iowa Hospitals and Clinics until his retirement in 1970. He was named a Fellow of AMWA in 1958. A prolific writer — the author of seven books, approximately 300 scientific articles and hundreds of book reviews — he also served as editor of a dozen medical journals. Among his many honors was AMWA's Swanberg Award, presented in 1969. In 1984, Dr. Bean was the Distinguished Guest Lecturer at the AMWA Annual Conference.

News Capsules

A Collection of Items of Interest for Medical Communicators

Special thanks to Toni L. Goldfarb for continuing contributions to News Capsules

Bladder Cancer Test Under Study

The National Cancer Institute (NCI) is working on a test that will detect bladder cancer and other hard-to-detect cancers in high-risk individuals at earlier stages. The NCI bladder test will detect the presence of the protein cytokine in urine samples. Cytokine is an autocrine motility factor (AMF), a secretion of cancer cells that induces movement and allows their spread.

More than 10,000 Americans die each year of cancer of the bladder. NCI researchers plan to develop a highly sensitive test that will detect AMFs in the blood to find cancers in other parts of the body.

Non-Smokers and Body Fat

A study by the National Institute on Aging provides more positive evidence why cigarette smokers should give up the habit.

Researchers have shown that increases in a measurement of body fat known as the waist-hip ratio were significantly less in men who quit smoking versus those who continued to smoke. The waist-hip ratio is significant because studies suggest that body fat above the waist is closely linked to an increased risk of cardiovascular disease.

The study, which included more than 1,100 men age 19 to 102, showed that the redistribution of body fat associated with smoking results in a higher waist-hip ratio. The study findings were reported in a recent issue of the *Journal of the American Medical Association.*

Outgrowing Cavities

A new study reveals that we do not outgrow cavities as we grow older, contradicting a long-held popular belief.

Dr. Howard Chauncey, of the Boston Veterans Administration Outpatient Clinic, and colleagues examined the dental records of 750 healthy men they had followed since 1968. The researchers found that the men, who ranged in age from their early 40s to the 90s, still had—on the average—24 of their 32 original teeth. Those men over 55 averaged about 2.5 new cavities every three years, compared with two cavities during the same time period for those men under 45.

"People thought that as you got older, you got fewer cavities. But the reason for that was that older people had fewer teeth. Now, people are maintaining their teeth, so they're still getting cavities," Dr. Chauncey said.

Elderly Prone to Drug Reactions

Almost a quarter of a million of the nation's elderly are hospitalized each year due to adverse reactions to prescription or over-the-counter drugs, according to a study by the Department of Health and Human Services (HHS).

Richard P. Kusserow, inspector general of HHS, warned that the department has found "a widespread problem of mismedication among older adults."

Mr. Kusserow said the problem results from "inadequate training and education for physicians in the area of geriatric pharmacology," and the failure of patients to follow physician orders.

Part of the problem, according to Mr. Kusserow, is that drugs are usually tested initially on healthy young people but may end up being used widely among the elderly, whose reactions and metabolisms are often different.

Condom Sales Fall Short

Condom sales in the U.S. in 1988 increased by only 7 percent over the previous year, leading some health experts to speculate that the heterosexual population is becoming complacent over the AIDS epidemic.

Approximately 417 million condoms were sold in the U.S. in 1988, not including an additional 200 million distributed by the army, hospitals and other institutional sources. That figure is considerably more than condom sales in the 1970s and early 1980s. However, the industry expected a higher percentage of increase in sales in 1988—and there's considerable concern as to why that didn't happen.

"I think denial has resurfaced in the heterosexual community," said Mervyn Silverman, president of the American Federation for AIDS Research. "We have to be explicit if we are going to get the job done."

Drug May Aid Memory

A drug previously approved by the Food and Drug Administration (FDA) to treat stroke patients has been shown to revive the power of the brain in rabbits to learn, according to a recent report in *Science.* The drug, nimodipine, might be useful in treating memory loss in humans, although researchers caution that more studies must be performed before any conclusions can be drawn.

The drug, manufactured by Miles, Inc., was first noted to improve learning in 1985 when German physicians noticed that stroke patients taking the drug experienced improved memory function, but usually with debilitating side effects. Nimodipine does not have severe side effects.

Book Reviews

Medical Cover-Ups in the White House. By Edward B. MacMahon, M.D., and Leonard Curry. Washington, D.C.: Farragut Publishing Company, 1987. 171 pp, $16.95.

Most of us are now aware that Woodrow Wilson suffered a debilitating stroke in 1915 that left the presidency in the hands of his wife and his physicians. We know that Jack Kennedy suffered from a variety of physical ailments, including a serious case of Addison's disease that was treated with the drug cortisone. And we're certain in our knowledge that Franklin D. Roosevelt, with an advanced case of atherosclerosis, was in no condition to attempt to serve an unprecedented fourth term as president during World War II.

The authors of this potentially provocative account offer much more than they actually serve up. The stories of medical deception at 1600 Pennsylvania Avenue are interesting, primarily because it was usually the president himself who engineered the cover-ups in order to maintain national security or economic harmony. However, most of the second-guessing of diagnosis and treatment is based on medical information and advancements known today, but unavailable during the time in question. In medical issues, hindsight is a luxury few of us have.

Perhaps the most interesting account is that of the assassination of James A. Garfield and his subsequent medical treatment to remove a bullet lodged within his body. Though historians have long held that President Garfield died from his assailant's bullet, the authors apparently rightfully contend that the president died from the gross incompetence of his attending physicians, who insisted on probing for the bullet with unsterilized equipment. Riddled with infection, the president eventually died of a heart attack. The assassin, Charles Guiteau, argued that the president's physicians were guilty of malpractice and pleaded for a lesser sentence. This line of defense might be considered clever today; however, it was ridiculed at the time and he eventually was hanged for the murder.

The authors also tell of the medical misadventures of President Grover Ceveland. President Cleveland was told by his physicians that he had a large cancerous tumor in his mouth that required the removal of most of his upper jaw. Not wanting his condition known, the president and his physicians planned the surgery on a ship sailing in New York harbor. The operation was performed, apparently successfully, and Cleveland survived another 15 years without a recurrence of the cancer. Medical authorities now question whether the original diagnosis was indeed correct and whether such an extensive surgery was necessary. Current medical evidence suggests it was not.

Medical Cover-Ups in the White House provides few insights into the medical care provided the most powerful man in the world. It might have been so much more.

(Reviewed by Ronald J. Sanchez)

AIDS and Its Metaphors. By Susan Sontag. New York: Farrar, Straus and Girous, 1989. 95 pp, $14.95.

Susan Sontag reprises her popular essay *Illness as Metaphor,* this time with a piercing look at all the various metaphorical images that encircle AIDS and serve to define it. Considering the frightening and ravaging images generated by the disease, she has formidable material with which to work.

The author first tests our concept of disease, whether it be cancer or AIDS, as an invading force that infiltrates our bodies and slowly gains strength and power over us. Disease is seen at war with our cells. This military metaphor is important, she believes, because it symbolizes our views of the conquest of disease, with the patient as the vanquished. She distinguishes between those diseases that merely destroy versus those diseases that disfigure and make alien the bodies we inhabit. She also notes the significance between those diseases that fall upon the victim as merely unfortunate circumstances of life and those that can be considered self-imposed by abuse or nihilism.

The concept of AIDS as a global plague, a sign of the apocalypse, is given considerable attention by Ms. Sontag. Because of its means of transmission — either sexually or by illicit drug use — AIDS is considered to be a disease to be hidden but, upon discovery, curiously identifies the person as a member of a social minority, a subclass, and as a pariah. Because we view it as a plague, we prefer to imagine its origins as foreign, far away — in this case, Africa. She discusses at length the progression of the disease and the concept of the "future ill," those people now infected with the AIDS-causing virus who eventually may develop symptoms of the disease.

AIDS and Its Metaphors is an interesting, if a bit redunant, work. It won't add anything new to the reader's understanding of AIDS as a disease entity, but it is a well-written, thoughtful discourse on the subject. Certain passages have a ring of familiarity, however. The author might have benefited from an editor who would have noted and eliminated those passages that tread over familiar ground.

—RJS

Reviews Welcome

If you're interested in serving as a book reviewer, contact the Book Review Editor, c/o AMWA National Office, to suggest possible titles for review.

"Dear Edie"

Edie Schwager

Institutional affiliations are given here for information and convenience only. The views expressed are not necessarily those of the institutions named or of AMWA.

DEAR EDIE: I would like your advice on word usage in reporting clinical testing of pharmaceuticals in animals. I've recently become aware of the controversy of using the word (or euphemism) "sacrifice." I've been told that "humanely killed" is a possible and better alternative. Does AMWA have a position on this, and can you give me information about this controversy and who supports either term?

I would prefer using "humanely killed" in our documentation and reports, but I would need some backing to convince those of our scientists and administrators resistant to change; they also may not be convinced if only a small minority in the field has implemented this change in terminology. Could you please also tell me which disciplines have adopted the preferred usage (i.e., in pharmaceutical, medical, scientific fields)?

GAYLE EARLY
Liposome Technology, Inc.
Menlo Park, California

DEAR GAYLE: I'm sure your letter will elicit responses from our colleagues in AMWA (which does not take positions on such issues). In the meantime, the short reply to your question is not to use the euphemism "sacrificed," but rather to use the accurate "killed," not "humanely killed." Certain government agencies and research institutions regulate experiments on animals so that this criterion is met. Some readers may want to elaborate on this point.

Both the AMA *Manual of Style,* 8th ed. (p. 156), and the *CBE Style Manual,* 5th ed. (p. 277), frown on *sacrifice* as a euphemism for *kill.* Most medical editors and writers use these sources extensively, and in general do consider them the authorities in the field of medicine. On this specific issue I agree with these two giants, and I believe that many, many other editors and writers do also.

DEAR EDIE: Regarding Ed Lindner's letter (Vol. 3, No.3), it is surprising to read that anyone serious about communication cannot be bothered to address women appropriately in a letter, yet expects those women to "pass it on to a guy." Such letters go directly into many women's circular files, unread. Anyone writing such letters on behalf of an employer should wonder if he or she is misrepresenting the employer's attitude toward women, thus jeopardizing its relationship with clients, suppliers, readers, members or whomever.

A readership is appropriately addressed by gender if that is, indeed, the group the writer wishes to reach. Otherwise, "Dear Colleagues," "Dear Editor," "Dear Monograph Reader" or any such specific salutation will do the job without alienating 50 percent (or 30 percent or 60 percent, depending) of readers.

Wake up, Mr. Lindner!

POLLY THOMPSON
British Columbia Medical Journal
Vancouver, B.C., Canada

DEAR EDIE: Ed Lindner's "I don't give a damn" attitude towards appropriate salutations is an affront to all writers, and to all women.

If writers don't take responsibility for eliminating sexist language, how can we expect others to relinquish thoughtless if not downright misognist attitudes?

Mr. Lindner may foolishly assume that women

(editors?) opening a letter addressed to "Gentlemen" simply "pass it on to a guy that hangs around the office." More likely, they note his arrogance before making a mental note not to do business with him.

ELAYNE CLIFT
Potomac, Maryland

DEAR EDIE: Thank you for your reference sources. This is a fascinating list (from the *Merck Manual* to the Bible!). I've already purchased *Harper's English Grammar* and plan to get several other titles.

Harper's makes good reading, but a few of the prescribed usages seem faulty. For example, what do you think of using interchangeable pronouns to avoid the monotony of *one* and *one's* as recommended on p. 59: "One sees many interesting sights as *he* [emphasis mine] travels through his native land"? I find this switch of pronouns confusing—not to mention sexist and just plain clumsy. Shouldn't one stick with the pronoun one has chosen?

SABINE J. BEISLER
American Occupational
Therapy Association
Rockville, Maryland

DEAR SABINE: John B. Opdycke, in *Harper's English Grammar,* is not the only authority to recommend varying *one* to avoid the monotony of repetition. Another source—*Modern English Handbook,* 4th ed., by Robert M. Gorrell and Charlton Laird—treats this grammatical problem as follows:

> Unnecessary shifts from one person to another can produce awkward constructions, especially in impersonal constructions, which do not develop gracefully in modern English. Constructions like *we find, they say,* and *you go* are common, but ambiguous. The indefinite *one* is less ambiguous but can become awkward, especially when the possessive *one's* is required. For all but the most formal writing, however, *one* can be combined with *he* and *his.*

For those who don't own *Harper's*—which I recommend for its scholarliness and comprehensiveness but not for its gender-specific language—I quote the following from it:

> [One] is often used, however, as a personal pronoun. . . , and it is called the indefinite personal [in this context]. The affected use of *one* for the sake of avoiding *I,* by which first person *I* becomes subordinated as indefinite third person, has nothing to recommend it. . .
>
> Perhaps *one* is the greatest offender in the violation of pronominal sequence. . . It may correctly be followed by another *one,* as *One never knows what one may come to.* But pronouns of first and second persons should not be used to refer to it, as *One never knows what you* or *we may come to.*

One should note that the latest copyright date of *Harper's* is 1965 B.G.C. and of the *Handbook* 1967 B.G.C. (before gender consciousness). Hence one understands the lack of hesitation in both sources about using the "indeterminate" *he* and *his.*

DEAR EDIE: There are in Stockholm a hospital called in Swedish *Karolinska Sjukhuset* and an associated research institute called *Karolinska Institutet.* The "et" at the end of each name is the Swedish definite article, which is tacked on at the end of a noun without a space. The institute is apparently doing a lot of significant medical research and is often cited.

The hospital was founded by the emperor Charles XII to care for the wounded among an elite corps of soldiers. *Karolinsk* is a formal Swedish adjective meaning "Charles's" and derived from the New Latin form of the name.

The institute is now being referred to in English through the bastard form, "Karolinska Institute." I have seen it in the *New York Times* and heard it in the public-television program, *Nova.* It has even crept into French as *l'Institut Karolinska.*

But English already has a perfectly respectable Latin-derived adjective meaning "Charles's," and that is "Caroline." The hospital should be called in English "The Caroline Hospital" and the institute "The Caroline Institute." My Esselte Swedish-English dictionary, which I as a translator by profession have always found extremely reliable, gives "Caroline" as a translation of *Karolinska.* Furthermore, Charles' tomb in Stockholm, *Karolinska Mausoleet,* is called "the Caroline Mausoleum" in the latest edition of Bannister Fletcher's standard *History of World Architecture.*

I wrote the *Times* about this and they replied that they would keep on using "Karolinska" because they have been doing so since 1980. Still, a practice of eight years hardly seems inveterate, and the reasoning seems weak for a publication that leaped on the "Beijing" bandwagon so readily while continuing to use "Moscow" instead of *Moskva,* "Munich" instead of *Munchen,* etc.

What do you think?

By the way, a prominent California research institute is now becoming known in literature around the world as "The Kaiser Permanent Health Care Institute."

THOMAS J. SNOW
New York, New York

DEAR TOM: I was delighted to receive your letter. We don't hear enough from translators.

Karolinska is the Swedish equivalent of the Medieval Latin Carolus (Charles), thus the adjective Caroline—of or relating to Charles. One trouble may be that some Americans are unable to make the leap from K to C, although these may be the very same people who are still using EKG (the German form) for electrocardiogram or electrocardiography instead of the logical English ECG. Then again, the greatest problem may be that many people don't know that *Caroline* relates to Charles. Everyone, however, knows at least one Caroline—who has nothing whatsoever to do, necessarily, with Charles.

I venture to say that Americans in general are more familiar with French, Italian or German than with Swedish. Now that you've enlightened us, at least our readers will use "Caroline Institute" rather than the inaccurate "Karolinska Institute." In time we may see the correct form used in all instances; in the meantime, the writer or editor could write "Caroline Institute (Karolinska Institutet)" as an aid to the reader.

You may have encountered, in your correspondence with the *New York Times,* the dragon known as House Style. There is no defense against this monster, whether it lies caged, panting heavily, at the *New York Times* or in my office in Philadelphia. You've done your bit, tilting your lance at HS. It does seem strange to see the *Times* perpetuate an error out of mere habit. One could come up with some better bit of sophistry than that. It also seems to me that the *Times* could change this "habit" with a mere wave of an editorial memo.

World atlases and gazetteers in English use "Beijing" rather than "Peking," in accordance with the directives issued by the government of the Republic of China. After 20 years of romanization of the Chinese alphabet, the authorities there came up with Pinyin (from the Chinese for "transcription"—transliteration), which was adopted by the U.S. Board on Geographic Names. This agency decides the spelling of place names for the use of the federal government. Pinyin was also adopted by the *Times* as of March 5, 1979. However, although the Chinese government specified "Beijing" for "Peking" and other changes for names of places and persons, the *Times* chose to retain Peking, Canton, Tibet and Inner Mongolia rather than substitute the Pinyin designations, stating that these "four place names. . . will continue to appear in *The Times* in their familiar forms."

It wasn't until November 26, 1986, that the *Times* surrendered to the red flag and started to use "Beijing" in its datelines and other places.

I didn't know whether to laugh or cry when I read your last paragraph. If that health care institute is indeed permanent, I'm glad. But is it the institute that's permanent or the health care—or what? For those who like a little American history once in a while, here's some:

Henry J. Kaiser (1882-1967) is unfairly remembered by some only as a failed automobile manufacturer. In truth, he was one of America's most innovative construction experts; he was the chairman of the executive committee of companies constructing the Boulder and Parker dams, and he devised methods of prefabrication and assembly that saved much time in ship construction. In conjunction with Howard Hughes, he designed plans for giant cargo planes. He was also chairman of the Kaiser Community Homes Corporation.

He built a cement plant in California. His wife liked the name of the nearby body of water so much that she asked him to include it—the Permanente Creek—in the name of his newly formed health organization. And so the Kaiser Permanente Foundation Hospital and Health Plan were born.

All the physician groups affiliated with this health plan carry the name Permanente in addition to any other designation.□

COMING IN FUTURE ISSUES

- *Editorial Services at a Medical Research Center*
- *Patient Education and Paternalism*
- *Attracting Minorities to the Health Professions*
- *A State-of-the-Art Report on Medical Communications in the Pharmaceutical Industry*
- *The Women's Health Movement: A Historical Perspective*
- *Folk Media: Old Ways to Communicate New Health Information*
- *Trends in Authorship in Medical Journals*
- *A Behind-the-Scenes Look at Work in a PR Agency*
- *News of the Upcoming Annual Conference in Boston*

Upcoming Medical and Scientific Meetings

Following is a list of upcoming meetings that might be of interest to AMWA *members. To include a meeting announcement in future issues of the* AMWA Journal, *please send the necessary information to Vincent W. Franco, 4400 East-West Hwy., Bethesda, MD 20814.*

- **International Congress of Gerontology**
  Acapulco, Mexico, June 19-23, 1989
  Contact: American Geriatrics Society
  770 Lexington Ave.,
  Suite 400
  New York, NY 10021

- **Calcium and Cell Function**
  FASEB Summer Research Conference
  Saxtons River, VT, July 9-14, 1989
  Contact: Dr. Robert W. Krauss
  Executive Director
  FASEB Summer Conferences
  9650 Rockville Pike
  Bethesda, MD 20814

- **Health Law and Ethics**
  Second International Conference
  London, England, July 16-21, 1989
  Contact: American Society of Law & Medicine
  765 Commonwealth Ave.,
  Suite 1634
  Boston, MA 02215

- **Biotechnology and Public Health**
  Boston, MA, July 18-20, 1989
  Contact: Office of Continuing Education
  Harvard School of Public Health
  677 Huntington Ave.
  Boston, MA 02215

- **Somatostatin**
  International Symposium
  Montreal, Canada, Aug. 6-9, 1989
  Contact: Somatostatin Secretariat
  3450 University Street
  Montreal, Quebec H3A 2A7
  Canada

- **Therapy With Amino Acids and Analogues**
  First International Congress
  Vienna, Austria, Aug. 7-12, 1989
  Contact: Dr. Gert Lubec
  University of Vienna
  Department of Pediatrics
  A 1090 Vienna
  Wahringer Gurtel 18
  Austria

- **Editing Into the Nineties**
  Joint Meeting of Council of Biology Editors, European Association of Science Editors, and Association of Earth Sciences Editors
  Ottawa, Canada, Sept. 10-14, 1989
  Contact: Ken Charbonneau
  CBE/EASE/AESE Meeting
  National Research Council of Canada
  Ottawa, K1A OR6, Canada

- **Mammalian Developmental Genetics**
  First Biennial Workshop
  Bar Harbor, ME, Sept. 14-17, 1989
  Contact: Linda Fournier
  The Jackson Laboratory
  Bar Harbor, ME 04609

- **Molecular Mechanisms and Their Clinical Application in Malignancies**
  12th Annual Bristol-Myers Symposium on Cancer Research
  Toronto, Canada, Sept. 26-27, 1989
  Contact: Virginia Mintz
  Ketchum Public Relations
  1201 Connecticut Ave., N.W.
  Suite 300
  Washington, DC 20036, *or*
  Panacea Convention Management
  3370 South Service Road
  Burlington, Ontario
  Canada, L7N3M6

AMWA Presents a Regional Conference

Serving Two Masters: EEC and FDA Regulatory Documents

September 15, 1989
Schering Corporation
Galloping Hill Road
Kenilworth, NJ 07033

In 1992 the European Economic Community (EEC) will institute uniform requirements for regulatory documents submitted to member nations. The morning panel discussion will analyze the new EEC requirements and explore how we can make the U.S. Food and Drug Administration's (FDA) requirements fit the EEC's new guidelines. The discussion will cover the historical development of EEC and FDA guidelines and their respective problems.

The afternoon sessions will go into more detail on how we can plan our tabular/graphic materials and text to fit EEC and FDA requirements.

PROGRAM

Morning Panel Discussion:

*Historical Development and Problems with EEC and FDA Documents (Moderated by Art Gertel, Schering Corp.)

Afternoon Sessions (choice of one):

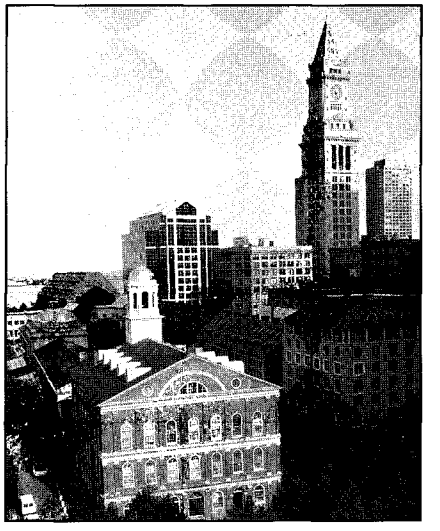
*Producing Tabular and Graphics Materials for Regulatory Documents (Howard Smith, A.H. Robins Company)

*Producing Written Materials for Regulatory Documents

COST $95 for AMWA members and employees of Schering Corporation
$105 for non-members

For more information, contact the AMWA national office: (301) 493-0003

It's Never Too Early To Begin Planning For The AMWA Annual Conference



Be There in Boston,
The Lafayette Hotel,
November 15-18, 1989

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