Editorial

This is What They Said About Medical Mavericks

I have just finished reading *Medical Mavericks*, Volume One, by Hugh Desaix Riordan (Bio-Communications Press, 3100 North Hillside Ave., Wichita, KS 67219, 1988). *Medical Mavericks* is a very interesting compilation of vignettes from medical history. The information may surprise many physicians, as medical history is neglected in almost all medical schools. This is a pity, as it has harmed patients and has deprived physicians from enjoying and understanding their own medical roots. If graduates knew their own history, they would be better equipped to deal with innovation, for the modern theory and practice of medicine is the result of repeated and vigorous conflicts between discoverers and innovators on the one hand, and defenders of the faith on the other hand.

Dr. Riordan's book is a gift to us all. It should be read by the defenders of the faith.

Innovators in medicine have not been well received, even though eventually their ideas have been incorporated into the practice of medicine. The need for stability must be ingrained in our genes, i.e. have survival properties. It is better to know where one stands before stepping off into the unknown. And it is true that many ideas considered innovative and true have turned out to be entirely wrong and even harmful. The problem facing us is this: how can one determine which new ideas are worth encouraging and supporting, when there may be an infinity of new ideas and finite resources. I have suggested that there is a solution and will come back to this later. But the first step is to recognize that innovative ideas based upon scientific data are important, must be examined seriously, and their creators must not be exposed to the kind of rough treatment handed out to our innovators until now. History will instruct us. The main lesson is that one's peers are not the honest, objective evaluators we would like to think they are.

In the title of this presentation, 'They' refers to the contemporaries of the discoverers or innovators, often the leaders in the field or the profession. I will refer to the innovator and to the reaction their ideas generated. These are all from *Medical Mavericks.*

1. Auscultation

For those of you who have never been given a physical examination or who have forgotten the ones they had, auscultation is a method of examining the interior of the chest using a stethoscope. It was discovered by Leopold Auenbrugger (1722-1809). Most of his contemporaries ignored his work. Others ridiculed him, and called the method "a molestation of the sick". The method began to gain popularity forty-seven years later.

2. Reconciling the New and the Old

Pietro D'Abano (1250-1315) was one of the last medieval scientists. He was a famous professor, but his attempt to reconcile the different views of physicians and philosophers who had lived before him was not well received. His disbelief in New Testament miracles made matters worse.

Eventually he was tried by the Inquisition, but luckily for him he died before the trial was completed. He was found guilty anyway and either his body or a surrogate body was burned at the stake.

3. Pellagra

Once considered one of the scourges of man, few physicians today even think about it, and might have difficulty recognizing it. It devastated the American south. Some years, twenty-five percent of patients in some mental hospital were pellagrins. Joseph Goldberger (1874-1929), working for the U.S. Public Health Service, was given the job of doing something about it. Dr. Goldberger was a specialist in infectious diseases. Within five months he concluded pellagra was a dietary disease

and he urged people to eat more fresh meat, milk and eggs (sources of L-Tryptophan and Vitamin B_3). The data he gathered was convincing — coming from some of the first controlled nutrition studies — but not to his peers. They said:

1. Some of his work was done secretly, implying it was therefore no good.
2. That he had defamed the U.S. South by claiming poverty caused pellagra. Everyone knew there was no poverty in the south.
3. Pellagra was caused by cornbread, or amoeba, or sugar, or infections, or by Italian immigrants, or by drinking soft water. Physicians even then believed in single causes, not realizing that nutritional diseases are complex and involve a number of deficiencies and excesses. All the causes, except Italians and water, certainly contributed, but were not the causes.

Goldberger fought back. He called his critics members of the impressionistic school of research, in which the researcher, in his comfortable chair, gazes out the window for a time and then announces his impression of scientific data. He called them "blind, selfish, prejudiced asses". However, no one challenged Goldberger to a duel, as was Dr. T. Syndenham several hundred years earlier when he found that reducing fever in patients with smallpox was beneficial. The standard lore was that fever was beneficial by driving out the poisonous vapours.

4. Circulation

Dr. William Harvey (1578-1657) recognized that blood circulated in the body from the heart, the pump, through arteries and back again in the veins. They said:

1. Harvey's theory is paradoxical, useless, false, impossible, absurd and harmful.
2. That Galen could never be wrong. If, therefore, blood circulated, the human body must have changed. Galen's views had been preeminent for centuries.
3. That even if the heart was a pump, it could only pump out one or two drops of blood each hour.

5. **Anaesthesia**

Henry Hill Hickman (1800-1830), a surgeon, found he could operate on animals, who appeared not to suffer pain if they were first made unconscious by lack of oxygen or by laughing gas (nitrous oxide). He proposed similar procedures might be used for patients. After he made such a proposal before the medical society of London, they laughed at him and said:

1. He was a dreamer, not to say a fool.
2. A danger to the faculty (of medicine).
3. His proposal to try his method on patients was crazy.

Useful anaesthesia was developed by William Morton (1819-1868), a medical dentist. Dr. Morton used pure ether to prevent pain during dental surgery. He tried to patent his discovery and soon became embroiled in a massive controversy over priority as well as the usefulness of his technique. He was attacked from all sides by dentists who knew little about his method and who told lies about him, and by doctors.

They criticized his work, for it was natural to suffer pain, and they scorned doctors who were afraid to inflict pain.

6. Antisepsis

Louis Pasteur (1822-1895) was the first to introduce and use vaccines for anthrax, rabies and chicken cholera. He helped prove there was no spontaneous generation, that all bacteria had ancestors. He created the germ theory. The medical profession was outraged, especially because Pasteur was a chemist, not a physician. He showed how to prevent spoilage of beer by heat-treating (Pasteurization).

Pasteur's work created the science of bacteriology and virology. The attacks on him were violent and included slanderous stories about him. They said:

1. Pasteur, not being a physician, was not qualified to study disease. Robert Koch (of Koch postulates fame), was especially provoked when Pasteur developed the vaccine against anthrax which he, too, had been studying. Koch published a paper denouncing Pasteur.
2. That Pasteur's process had failed and he had to flee from the village where he was staying while his pursuers threw stones at him (not true).
3. When some of the patients vaccinated with anti rabies vaccine did not respond, he was called an assassin in medical

journals.

However, he never quit, "Rather he ran down and over orthodoxy like a roaring cavalry charge." His work can never be forgotten, and the Institute Pasteur in Paris continues to investigate the field opened up so dramatically by Pasteur. His work provided a rational basis for observations of physicians like Ignatz Semmelweis, who saved many women from death from childbed fever by washing his hands, and Joseph Lister (1827-1912), whose name lives on in the trade name Listerine.

Early surgeons were ignorant of bacteria and infection, but it soon became general knowledge that, as the number of surgeons increased, so did the death rate from septicemia, gangrene and erysipelas.

Lister had heard about Pasteur's work and immediately drew the right conclusion: Pasteur's bacteria were the cause of these infections. He knew he had to kill these bacteria. Pasteur, in his laboratory, used heat, filtration, or antiseptics to do so. Lister began to use antiseptics — the first, carbolic acid. In 1867 he published his first paper in *The Lancet*. There he described his complicated method of antisepsis used in treating compound fractures. But physicians could not understand his method because they were unaware of the germ theory. Following his report the controversy grew intense. Physicians who did not follow his technique published the results of their failure in medical journals. Gradually, however, his work became established in other countries but London physicians remained firmly opposed. They said:

1. He must provide statistical evidence of the efficacy of his system.
2. That surgeons not using antiseptic methods were getting equally good results, but they did not point out that Lister was doing surgery using his method on patients whom surgeons had hitherto refused to touch because of the danger of infection.

He was appointed head of clinical surgery at Kings College, London, and began to introduce his methods. His greatest opposition came from the nurses, who were the authorities on cleanliness and on rules of conduct. They blocked Lister as much as they could. His work was rejected just as strenuously by his colleagues. Their attitude was known to medical students, who refused to attend Lister's lectures; they had discovered they would fail their examinations if they used his ideas in their papers.

By 1880 (thirteen years after his *Lancet* report), most of the opposition had disappeared, and in 1897 (thirty years after), *The Lancet* declared, "Listerism is destined to be the surgery of the future."

Dr. Hugh Riordan describes only a small number of innovators and how the ideas were received, but he promises to issue more volumes in due course. These histories, however, are adequate to raise again the most important issue of all — how to recognize innovative ideas that are promising and worth pursuing or, conversely, how to reject ideas which have little promise of being valuable. Now this is done by the usual methods already described. It does work, but the price is great. It has been estimated that in medicine it requires forty years before valuable ideas become established (thirty years in chemistry, twenty years in physics). Can we afford this enormous lag (two generations)? Forty years after Sir James Lind proved oranges and lemons cured and prevented scurvy, the British Navy began to issue limes to their sailors. During those forty years, 100,000 seamen died from scurvy. The U.S. Navy took action much later. The British Navy defeated Napoleon because they ate limes; they could stay at sea longer without getting scurvy. The French Navy could not stay out from shore long enough. Thus, it is clear, long delay in applying medical discoveries are very costly and, conversely, application of these ideas very beneficial; in modern terms, cost-effective.

The method we use now (which requires several generations) depends upon the scientific method. Its basis is: (1) observation, which may be chance or forced by experiment, (2) publication by lecture or in journals, (3) accurate replication of the experiments; this means using similar patients, the same treatment design, and the same measures of response, (4) further publication. Unfortunately, in modern medicine, the scientific method is not followed and whether or not findings will be accepted depends too much on authority,

such as being a professor in a prestigious school. So, to the four stages we must add a major rule, a way of bypassing the subjectivity of authority.

I believe this can be done and will be done. There is some evidence the U.S. government is beginning to adopt such measures. The best example was the pressure Congress applied to the National Cancer Institute to become interested in clinical nutrition and cancer.

We can markedly shorten the gap between discovery and application and weed out spurious and useless ideas by creating special clinical investigative institutes. They would be funded by governments and be maintained free of political influence by annual operating funds and with responsibility to Congress or Parliament, as are many of our agencies today. Their mandate, by law or by Constitution, would be to examine in a responsible way, every innovative idea in medicine, following a procedure designed to test only ideas likely to be effective. They would use the following stages.

1. Examine every new therapeutic method found to be successful in treating disease in a clinical trial and published in a scientific or medical journal. They would not be allowed to test ideas which had not been tested clinically, i.e. they would not be allowed to do original research.
2. Having determined that this test is met, the institute would send one of its investigative physicians to the place where the research was done to study the treatment advocated, to examine all the patients treated (not only their charts), and to report back to the institute. If the claims of the innovator were confirmed, the institute would begin the third phase.
3. The institute would invite the innovator to come to their institute and there to treat patients using his/her best methods with full awareness of the clinical staff of the institute. As soon as the innovator concluded, the clinical staff now knew the method and were using it appropriately, the innovator would be sent home.
4. The clinical staff would now replicate the studies originally reported. They

would not be allowed to alter the method or to do new research, since their task would be to test claims, not to establish new ones. Once a method is established, there are enough research institutes and individual physicians able to improve and advance treatments. 5. The last stage would be a report to Congress or to Parliament outlining the results of the various experiments. The final conclusion would be simple:

a) The original observation of the in novator was supported, or,
b) They could not be supported.

There would be no discussion of why or how, positive or negative, because again this would not be the function of the institute.

It goes without saying that the medical ethics of all therapeutic trials must be adhered to. It also goes without saying that these institutes must be free of all conflict of interest, real or potential. The institute and their staff would not be allowed to have any affiliation or association with any other institution including universities, other government agencies or departments, medical associations, lay health or disease oriented associations, all industries including the drug industry and the high-tech food industries; nor would the institute be allowed to receive any financial or other support from anyone but the government of the country in which it was located. Of course, such an institute can only operate freely in democracies.

I hope some day a government will set up a commission to inquire into the slow progress in medicine. This commission could then seek the best opinions on how to solve this major problem. I believe my suggestion is one such solution. In my opinion, there will be no relief from the ever-rising costs to patients, families, and communities, until we solve the problem — how to shorten the gap between research and development, and how to avoid wasting resources on ideas which are eventually proven wrong. Think of the enormous benefits our society would have earned if such an institute were in existence when Freud first published his work on psychoanalysis, or if one had been in existence when Goldberger reported his first con-

elusions, or if we had had such an institute when Sir James Lind completed his first experiment on eight scorbutic sailors using oranges and lemons. Had we had such institutes, modern psychiatry would be in the forefront of medical research, not just coming in, since psychoanalysis — now moribund — has held us back at least forty years.

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