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Ideas and Experimental Proof
What if wise men had, as far back as Ptolemy,
Judged that the earth, Like an orange was round,
None of them ever said, Come along, follow me,
Sail to the West, and the East will be found.—Arthur Hugh Clough. 1819-1861.

FIBEROPTICS FOR INTRACARDIAC OXIMETRY

How Medicine Became a Science

The infiltration of medicine by science had so far been slow, but from the middle of the nineteenth century the progress became rather geometrical than arithmetical in rate of advance. Up till 1830 the value of microscopy had been lessened by the difficulty in overcoming chromatic aberration, but in that year Joseph Jackson Lister, the father of the famous Lord Lister, devised a method of remediying that defect. From that time onwards the scope of microscopic observation rapidly extended and the new science of histology was born. In 1837 Schleiden and Schwann demonstrated the cellular structure of both plants and animals and round about 1850 the microscope became the constant companion of the physiologist and pathologist. The most remarkable result following from the advance of microscopy was the demonstration of the microorganisms of disease. Though Bassi in 1835 had found that a fungus was the cause of a disease of silkworms, and Davaine and others had seen the bacillus of anthrax, it was due to the immeasurable genius of Pasteur that, from 1850 onwards, bacteriology became an established science, and acquired immunity was shown to be a practical possibility.—Zachary Cope, Kt. Some Famous General Practitioners and other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. 191.

Reports of Medical Cases, With
a View of Illustrating the Symptoms and Cure of Diseases
By Richard Bright—1827

In this case we have the most unequivocal proof of the derangement of the kidney being connected with the extensive and sudden occurrence of anasarca;—there could indeed be no doubt of this, from the first moment that I had an opportunity of seeing the patient. The coagulable urine,—and the urine already containing the red particles of the blood in large abundance,—led me from the beginning to form my opinion as to the seat of the disease. Moreover, dissection showed no other adequate cause for the dropsical affection: and as during life no suspicion could be entertained that either the liver, the intestines, the heart, or the lungs were diseased, so the examination showed all these organs to be in a state of perfect health. I feel that it may be matter of doubt how far the employment of diuretics during such diseased tendency may have been instrumental in producing the peculiar appearance of the kidneys; but it is to be remembered that the particular symptom, the haematuria, which appears so immediately connected with this morbid state, has been observed to occur in a greater or less degree under all modes of treatment, and even before any treatment has been adopted in the sudden anasarca, and therefore we cannot in fairness ascribe the morbid appearance of the kidney to the remedies,—or at all events we must admit a certain high degree of disease to have existed in that organ from the commencement of the symptoms; but whether to the extent discovered in this case after death or not, we can never determine.


Limitation of Medicine as Applied Science

The conversion of the practical arts into applied sciences is a characteristic and familiar process in modern civilization. The rate at which this change is going on is often the subject of enthusiastic and even excited comment. To the sober realist, however, it is clear that the rule of science in medicine is still not much more than strictly local and much qualified. The cases are very few in which general principles can be applied to the individual instance with the direct precision of an engineer designing a dynamo. The diagnosis and treatment of errors of refraction, certain cases of bacteriological and of chemical diagnosis, and others of physical diagnosis and treatment, with the dietetic deficiencies, make up the examples of nearly pure applied science. Elsewhere methods of precision must be very strictly subject to the art of medicine if they are not to become a mere snare. The affectation of scientific exactitude in circumstances where it has no meaning is perhaps the fallacy of method to which medicine is now most exposed.—The Collected Papers of Wilfred Trotter, F.R.S. London, Oxford University Press, 1946, p. 159.


James Mackenzie—General Practitioner and Cardiologist

Mackenzie's work and example are of the greatest value today. His researches did not depend upon the laboratory nor upon hospital facilities but upon that continuous and careful observation of patients which is only possible in general practice. There is no doubt that his work led to the recasting of our views on cardiac disease. Sir Thomas Lewis said of him: "He did more perhaps than any other man before him to place upon a rational basis forecasts of the course of heart disease in individual patients, and the treatment of heart disease by digitalis." That is high praise by one who was himself an expert in that line. But in quite another way Mackenzie deserves to be acclaimed. He is the best modern example of achievement in general practice, of high endeavour under difficult circumstances leading to results which must for ever be an encouragement to everyone engaged in that front line of the National Health Service.—ZACHARY COPE, KT. Some Famous General Practitioners and other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. 26.

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**English Medicine Before 1500 A.D.**

Up to the time of the Tudors the practice of medicine was the province of the physician, who was a man of learning, generally in Holy orders, and usually a graduate of Oxford or Cambridge, where he first took a degree in Arts and then proceeded to study medicine. The whole course of study might take up to fourteen years. Alternatively the physician might be licensed by the Dean of St. Paul's or the Bishop of London or of the diocese in which he lived. Up to the time of Henry VIII physicians diagnosed disease according to methods handed down from antiquity, and gained their knowledge by study of volumes written in the Latin or Greek tongue, never in English. They prescribed medicines, but it was considered beneath their dignity to dispense them. The dispensing was done by the apothecaries, whose shops were inspected by the physicians to see that all was in order. No physician was allowed to perform any cutting operation, but he could direct the surgeon to do it for him. . . .

The surgeon and barber-surgeon were on a lower educational plane than the physician; they belonged to their respective Company or Guild and were trained on the apprentice system. The physician often told the surgeon what he wished to be done and sometimes supervised the operation. The general function of the surgeon was to treat injuries and external ailments, but he was also allowed to treat some general diseases such as syphilis and the plague, although he was not supposed to prescribe for internal ailments. Midwifery was usually in the hands of women who had gained their knowledge by practical experience.—ZACHARY COPE, KT. *Some Famous General Practitioners and other Medical Historical Essays*. London, Pitman Medical Publishing Co., Ltd., 1961, p. 29.


How Medicine Became a Science

If I were asked to give a definite date for the birth of modern scientific medicine I should unhesitatingly choose the year 1858. In that year Virchow published his Cellular Pathology, which is regarded as the beginning of modern pathology; in the same year a new world in organic chemistry was opened by the work of Couper and Kekule, who proved the quadrivalency of the carbon atom with the possibility of chain formation in the molecule. In 1858 Pasteur published his paper on the fermentation of lactic acid which has been acclamed as the beginning of modern bacteriology; while at that time Claude Bernard was at the height of his career as experimental physiologist; he had just demonstrated the glycojenic function of the liver, in that year he showed the vaso-constrictor effect of stimulation of the sympathetic, and he was soon to publish his Introduction to the Study of Experimental Medicine, a medical classic. In 1858 Darwin had just completed his Origin of Species which was published in the following year. From the British point of view the year 1858 is of importance because it was in that year that the General Medical Council was set up and the Medical Register started. There is clearly some justification for marking that date as important in the history of scientific medicine.—Zachary Cope, Kt. Some Famous General Practitioners and other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. 191.
References

Science and Elegance
The experiments adduced by Dr. Franklin in support of his hypothesis were most ingeniously contrived and happily executed. A singular felicity of induction guided all his researches, and by very small means he established very grand truths. The style and manner of his publication are almost as worthy of admiration as the doctrines it contains. He has endeavoured to remove all mystery and obscurity from the subject; he has written equally for the uninitiated and for the philosopher; and he has rendered his details amusing as well as perspicuous—elegant as well as simple.—Sir Humphry Davy. Quoted by E. N. da C. Andrade, in The scientific work of Benjamin Franklin, Nature 177, 61 (1956).


The Meaning of a Profession

What quality distinguishes a profession from a vocation or a trade? Society grants professions a high order of autonomy and self-regulation and at times may provide them with solicitous care. The medal has two sides, however, and by unwritten contract, society expects something in return.

Of the Law, society expects government-under-law; of Divinity, nurture of the spiritual life of man; of Medicine, health; and, of Science, advance in knowledge. The people look to the three secular learning professions for changes which keep pace with their own changing worldly expectations and needs; to Divinity they look for guidance toward transcendent and eternal values.—Introduction, Edward D. Churchill, M.D. Listen to Leaders in Medicine. Edited by Albert Love and James Saxon Childers. Atlanta, Tupper and Love, Inc., 1963, pp. 7 and 8.
atrial fibrillation when mitral stenosis is present or suspected. In patients with mitral stenosis, the usual finding was an inverse relationship between the Q-1 interval and the preceding cycle length, i.e., as the cycle length increased, the Q-1 interval decreased. Severe degrees of stenosis appeared to cause characteristic variation of the Q-1 interval even at relatively long cycle lengths, reflecting the longer persisting pressure gradient across the mitral valve. In the absence of mitral stenosis, there generally was no such Q-1 variation, particularly with cycle lengths of longer than 0.6 second.

References


Research: Basic and Applied

Generally, when some new instrument in the equipment of civilization excites wonder, it is the mystery of the instrument itself, rather than the broad sweep of the basic principles of science, upon which amazement dwells: it is with the electrical gadgeteer, for example, more often than with Maxwell or Hertz, that the marvel of radio-communication is commonly associated.—Norman Feather, Lord Rutherford (1940).

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boy was thought to be in considerable jeopardy from the recurrent aortic stenosis, and re-operation was performed by the same surgeon. Again, the valve was carefully described and drawn. Again, the valve cusps were thickened with rolled margins. There was complete fusion between the left and right coronary cusps and almost complete fusion between the right and non-coronary cusps. The valve looked virtually the same as before the original valvotomy. Subvalvular stenosis again was not found. The fused commissures were incised out to the aortic wall, and the systolic pressures in the left ventricle and aorta at the conclusion of operation were 120 and 90 mm. Hg, respectively. His postoperative course was uncomplicated, and he was discharged with a blood pressure of 100/70 and a grade-II/VI ejection systolic murmur in the aortic area. There was no diastolic murmur.

He was last seen in April 1964, 1 year after his second operation. At that time he felt more energetic than he had in the past, and was inclined to participate in active games. The headaches were no longer a problem. The heart was quiet and not hyperactive. The murmur was graded IV/VI. A thrill was palpable in the suprasternal notch and over the carotid arteries. The blood pressure was 100/75 mm. Hg.

Summary and Conclusion
Aortic stenosis may recur within 5 years after surgical incision of fused commissures. Surgery for congenital aortic stenosis, although remarkably beneficial and gratifying is often only palliative in nature.

Reference

The Gold in Useless Knowledge
Discussion of the value of basic research is as pertinent today as it was when Faraday, queried about the usefulness of his discovery of electric induction, countered with the question, "Of what use is a newborn baby?" . . . There must be a marked increase in support with no strings attached for our "idea" men and women—that is, support for the person with ideas and not support for a project. No large numbers of people are involved; there are perhaps no more than 2000 senior investigators in basic medical research in this country. Surely 10 or 20 per cent of these with ideas or of junior associates with ideas could be given the kind of support for research that is needed. Unrestricted support for our men and women with ideas would scarcely be noticeable in our economy and would bring incalculable benefits in health to millions who would otherwise suffer from disease.—Wendell M. Stanley, University of California, Berkeley.
otics was instituted prior to surgery and continued for 4 weeks postoperatively.

In any case of bacterial endocarditis, it is desirable to eradicate the infection before repair of the valve lesion. In patients who develop aortic insufficiency, however, the prognosis is sufficiently poor to require early surgical consideration. When uncontrolled heart failure develops during the course of antibiotic therapy, surgical correction of the hemodynamic defect may become urgent. The patient described in this report presented such a problem. The encouraging result of a combined program of vigorous antibiotic therapy, resection of the infected valve, and correction of the hemodynamic abnormality suggests that in selected cases active bacterial endocarditis need not be considered a rigid contraindication to aortic valve replacement.

Summary

This report describes a 45-year-old man who developed acute bacterial endocarditis involving the aortic valve due to Klebsiella type 19. Consequent to the infection the patient developed aortic insufficiency and congestive heart failure. The patient failed to respond adequately to antibiotic therapy alone and rapid clinical deterioration required that the aortic valve be replaced despite the presence of active infection. Excision of the aortic valve appears to have removed the site of infection and replacement with a Starr prosthesis has corrected the aortic insufficiency. The patient has been followed for 15 months since the operative procedure, during which time he has returned to his work as a bricklayer. The encouraging result obtained in this patient suggests that in selected instances, valve excision and replacement under antibiotic coverage provide a possible therapeutic approach to certain difficult cases of active bacterial endocarditis.

Acknowledgment

The authors wish to acknowledge Dr. William J. Reid, of Greensboro, North Carolina, who referred this patient to Duke University Medical Center, made his records available to us, and has continued to follow the patient with interest.

References


Effortless Superiority

To do hard things without show of effort, that is the triumph of strength and skill.—A. J. Rowland.

Circulation, Volume XXXI, March 1965
How Medicine Became a Science

The latter part of the seventeenth century was dominated by the intelligence of Newton, whose influence on medicine was indirect. The influence of Newton was still strong at Cambridge when Stephen Hales arrived there, and it is likely that the same influence may have been at work to induce Francis Hauksbee to support Cheselden's lectures on anatomy by teaching his students the mechanics of the human body. The latter part of the seventeenth century saw a large field opened for observation by the development of the microscope. Working with simple apparatus Hooke, Malpighi and Leeuwenhoek gave accurate descriptions of many minute objects. Leeuwenhoek pictured some microorganisms which have in modern times been identified as common bacteria of the mouth. In the same period Robert Boyle's chemical researches showed that air was necessary for animal life, and a few years later Lower and Mayow showed that it was a special part of the air which was essential for respiration; unfortunately the definite discovery of oxygen was not to be made for another century.—ZACHARY COPE, KT. Some Famous General Practitioners and other Medical Historical Essays. London, Pitman Medical Publishing Co., Ltd., 1961, p. 187.