CURRENT THOUGHT ON HARVEY

BY

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Prospect as well as retrospect marks the character of this week's Harvey Tercentenary Congress at the Royal College of Surgeons, and it is good that it should be so. There is no sharp dividing line which marks off past from present, history from current research. In pointing out those strands of the past which are woven into current thought the historian forces us to examine more closely and more objectively much of what is accepted as fact. When the historian is engaged in tracing the development of ideas in science and medicine his work is an essential complement to research, for it helps to maintain conditions favourable to critical inquiry and the emergence of new ideas, without which the most elaborate experimentation in the most splendidly equipped research laboratories becomes dull routine.

Nowhere is the emergence of a new fundamental truth from a critical examination of past beliefs more beautifully demonstrated than in Harvey's own *De Motu Cordis*. For generations medical historians have argued the significance of Harvey's debt to the past and some have questioned the originality of his ideas, so that eminent physicians paying tribute to Harvey's genius have felt it safer to emphasize the revolutionary nature of his work purely as a demonstration of scientific method. But the ideas and opinions of historians themselves have to be submitted to the same kind of scrutiny, and the reassessment of Harvey's place in the history of scientific thought has been proceeding steadily since 1928, when the tercentenary of the publication of the *De Motu Cordis* was celebrated. Some important aspects of this new assessment are to be found in the current issue of the *Journal of the History of Medicine* (1957, 12, No. 2) which is a commemorative number devoted entirely to Harvey. The editor of the journal, Dr. John Fulton, professor of the history of medicine at Yale University, has invited contributions from a

number of countries, and, of the 21 papers included, nine come from Britain, four from the United States, and one each from Canada, Denmark, East Germany, France, Israel, Italy, Spain, and Sweden, a collection which can truly be described as an international tribute to Harvey's memory.

Harvey's Debt to the Past

In an attempt to place this in its proper perspective no fewer than nine of these papers are concerned with the body of knowledge which was available to Harvey when he began to formulate his new doctrine. In a brief note on Harvey's use of Galen, Mr. Kilgour, of Yale, reminds us

that in the *De Motu Cordis* alone Harvey quoted Galen a score of times, and with the greatest respect, in support of his new findings. Galen was, like Harvey himself, one of the greatest of experimental biologists, and Professor Lain Entralgo (Madrid), who published in 1948 a Spanish translation of Harvey's works, here provides us with an admirable summary of the scientific thought and method of both Galen and Harvey. Scattered quotations cannot do justice to this closely reasoned and penetrating analysis, but a few points should be noted. Harvey's inductive method was not that of Bacon but of Aristotle—and Padua, it will be recalled, was the stronghold of Aristotelianism. "To Galen his experiments were a paean of nature; Harvey's experiments are an ingenious trap to force nature into admitting the truth. . . . In Harvey's very simple calculations

the expression of reality in terms of formal mathematical laws is still minimal. . . . [He] is still far from thinking, like Galileo and Descartes, . . . that the book of nature is written in mathematical language, and still farther from believing that only that which is measurable is true."

If Entralgo portrays Harvey as a Janus-like figure facing both past and future he does so in no spirit of denigration, and even suggests that this dual character has advantages over the narrow philosophy of some moderns. But the process of revealing Harvey's debt to the past has sometimes been employed to serve chauvinistic ends rather than the interests of historical accuracy. It is refreshing to see the "allusions, anticipations, and counter-claims," familiar to all who have studied the history of the discovery, so thoroughly examined and so decisively dismissed as they are in the long study by Walter Pagel. This shows how the idea of "circular motion" in the body is linked with circular

William Harvey, circa 1622

Formerly at Rolls Park, Essex

motion in the universe in order to satisfy the age-old analogy of microcosm and macrocosm. It is in this context that the "allusions" in Plato, Thomas Aquinas, Cecco d'Ascoli, and others (all quoted in translation) should be understood. They have little or nothing to do with physiology. The passages which are often employed to support claims for Cesalpino are quoted and examined at length, with the conclusion that "a reconciliation of his 'correct' and his 'incorrect' statements hardly supports the extreme claims made on his behalf in the history of the discovery of closed blood circulation. Cesalpino did not discover it."

Felix Boenheim, the present Director of the Institute of the History of Medicine at Leipzig founded by Karl Sudhoff, studies eastern parallels to the western ideas examined by Pagel, and particularly the claim first made by the Jesuit Father du Halde in 1770 that "the Chinese had known about the circulation of the blood for at least 2,000 years," with the conclusion that "it is evident that the Chinese did not know anything about the circulation of the blood in the Harveian meaning. Their doctrine is mystic, not biological."

Pagel's judgment on Cesalpino is strongly reinforced by Louis Chauvois, of Paris, whose new biography of Harvey has just been published in simultaneous French and English versions. Professor Pazzini, of Rome, writes of Padua as the nursery rather than the progenitor of Harvey's genius, and stresses the value of the training in the techniques of experimental biology offered there by Fabricius. Lord Cohen of Birkenhead rates the influence of Padua as highly as does Pazzini, but suspects "that a chance (though inaccurate) observation led Harvey to postulate a continuity of arteries and veins . . . [i.e.] 'that the arteries contain the same blood as the veins and nothing but the same blood.'" This may be true, for a discoverer does not always recall accurately what first put him on the track. Harvey told Boyle that his first clue was the valves in the veins, and Professor Leibowitz (Jerusalem), who discusses here early accounts of their discovery, credits Amatus Lusitanus with the first published account (1551) of the valves (in the azygos vein), but concludes, "It is clear that Amatus did not understand [their] physiological significance . . . any more than did all the other authors before Harvey, including Fabricius."

The early history of the discovery of the pulmonary circulation has also been the subject of much study since Meyerhof, in 1933, drew attention to the clear and convincing description in the surviving manuscripts of the thirteenth-century Arab, Ibn-an-Nafis, of Damascus. Recent research indicates the probability of some link (possibly by way of Andrea Alpago) between this early description and its "rediscovery" by Servetus and Colombo (cited by Harvey) in the sixteenth century. Professor O'Malley (Stanford University) offers some further suggestions towards a clarification of this problem.*

It should be noted that there are now no outstanding claims, from East or West, for priority in the discovery of the general circulation, and after this very thorough exposition of the climate of ideas in which Harvey began his great work those who come to praise Harvey may give him due credit for originality of thought as well as of method.

The Reception of Harvey's Discovery

How Harvey's little book impressed his younger contemporaries is vividly illustrated in a letter quoted by Professor Gotfredsen, of Copenhagen, writing of the reception of Harvey's doctrine in Denmark. This letter was written at Leyden on July 13, 1631, by a Danish student, Jacob Svabe, to his former teacher in Copenhagen, Oluff Worm, and in it he says, "This doctrine so greatly impressed my mind that, for a full week, I was quite heartsick owing to these profound thoughts." The young man consults his middle-aged professors (Conring, van Heurne, van Valkenburg) and is put off with platitudes: "in changing old

theories and approving of new ones we must rather be timid and hesitating than audacious and temerarious."

In spite of Worm's opposition, it was another of his protégés, Thomas Bartholin, who contributed most to the establishment of the doctrine in Denmark. Aided and abetted by his master at Leyden, Joannes Walaeus, Bartholin was also responsible for its first appearance in an anatomical textbook which was used widely throughout Europe. In neighbouring Sweden, Olaus Rudbeck chose the circulation as the theme of an academic dissertation which he defended at Uppsala in May, 1652. Dr. Sten Lindroth discusses this thesis at length, and traces the influence of Descartes as well as Harvey; for Rudbeck's teacher, Olaus Stenius, was Uppsala's first Cartesian and may even have met the philosopher at the court of Queen Christina. The Scots, as Douglas Guthrie shows in his survey of the Harveian tradition in Scotland, were strangely unenterprising in this cause. Archibald Pitcairne in 1701, when the circulation was already generally accepted, was the first Scot to write in its favour. As a guide to the reception of Harvey's doctrine in various countries, Dr. Ernst Weil has compiled a useful bibliographical table of Harvey references and allusions, both favourable and adverse, published in Harvey's lifetime.

Other Aspects of Harvey's Work

The *De Motu Cordis* has made us familiar with the range and character of Harvey's biological experiments, but the value of his work in this field is underlined by the very informative paper by Dr. F. J. Cole entitled "Harvey's Animals." From a study of Harvey's published work, as well as his lecture notes, Dr. Cole has collected references to "128 types of animal life which fall into the following categories: Zoophyta, Worms (3), Crustacea (4), Insecta (12), Arachnida, Mollusca (6), Fishes (18), Amphibia (3), Reptilia (4), Birds (33), Mammals (43)." The species are named and Harvey's work with them is briefly discussed, and the author believes that the evidence admits "of no conclusion but that he was the pioneer of the experimental method in biology."

Although this claim seems reasonable, it will surprise many to find the formidable array of evidence which Richard Hunter and Ida Macalpine have succeeded in amassing to support the claim which they make for Harvey as neurologist and psychiatrist. Why this evidence has so far been neglected is that it lies in scattered observations in his own notes and in the writings of others. "Modern neurology," state the authors, "developed from two fundamental discoveries—to each Harvey contributed: firstly, the distinction between motor and sensory nerves and, secondly, the differentiation of irritability from sensibility and contractility." Among the conditions recognized as of "nervous" origin by Harvey are syringomyelia, hydrocephalus, epilepsy, apoplexy, paralysis, loss of sensation, blindness due to cerebral disease, delirium, phrenitis, and coma. He also gave one of the earliest clinical descriptions of *folie à deux*, and "clearly recognized the signs and symptoms of the condition familiarized as 'la grande hystérie' by Charcot at the Salpêtrière more than two hundred years later." The authors also draw attention to the notes which Harvey wrote in a volume of Galen's tracts, now in the British Museum Library, which illustrate "how much thought he gave to mental illness."

The remaining contributions to this outstanding special number are of a biographical or bibliographical nature. Professor K. J. Franklin, whose new translation of the *De Motu Cordis* is published this week for the Royal College of Physicians, discusses the various attempts which have been made to produce an English translation which conveys Harvey's thought and style and gives some details of the various translators. Dr. Krumbhaar, of Philadelphia, thinks that the time is ripe for a bibliography supplementary to that of Sir Geoffrey Keynes in which all the literature that has been written about Harvey and his work would be brought together and classified. Dr. W. B. McDaniel, also of Philadelphia, describes the collection of Harveiana in the

*This paper should be read in conjunction with another on the same subject by Edward D. Coppola in the current issue of the *Bulletin of the History of Medicine*, 1957, 31, 44-77.

library of the College of Physicians in that city, built up chiefly through the efforts of Weir Mitchell.

Dr. W. W. Francis, of the Osler Library at McGill University, gives an English translation of the untimely verses on the death of Harvey which Nikolas van Assendelft prefixed to his Dutch translation of the *De Motu Cordis* in 1650. The present writer contributes a note on the official probate copy of Harvey's will with the grant of administration made to Eliab Harvey in May, 1659, now in the Wellcome Library; and another note drawing attention to a hitherto unnoticed English version of the *De Motu Cordis* published in London in 1714.

Most interesting, however, for the fresh light which it throws on Harvey's personality, is the manuscript of a Harveian oration, almost certainly the missing oration of 1662 delivered by Sir Charles Scarborough, which has been discovered in the Bodleian Library and is described here by Mr. L. M. Payne, Assistant Librarian at the Royal College of Physicians. Scarborough was Harvey's own pupil and anything he has to tell us of his master must be enormously interesting. Some kinder and gentler touches are added to Aubrey's portrait, for we are told of "his candour of mind, charm of manner, and an affability which made it easy for all to meet the old man and ply him unceasingly with questions. One returned from his presence not only wiser—this was always so—but often more cheerful. The sharpness of his intellect continued unimpaired and a certain youthful disposition persisted to the end, as if this keen mind could not be weakened by age." Even better is Harvey's own reply to his friends, who urged him to reply to his detractors: "It is of no great importance that I for my own gratification should molest for a second time the republic of letters. I will not be the author or sponsor of any new controversial doctrine. Let my thoughts perish if they are worthless, my experiments if they are erroneous, or if I have not properly understood them. I am satisfied with my industry. It is not in my nature to upset the established order. . . ."

What better phrase could be chosen for closing this notice? For there speaks the very voice of the man who calls himself on the title-page of his epoch-making book, "William Harvey, Englishman," uttering the greatest understatement in the history of science.

FROM BOTH SIDES OF THE IRON CURTAIN

[FROM SPECIAL CORRESPONDENTS]

Below we print two dispatches from correspondents who attended congresses abroad last month, one on either side of the Iron Curtain. The first records a visitor's impression of what is said to have been the first international medical congress in Rumania; the other picks out some of the more challenging papers read at the May meetings of the American Society for Clinical Investigation and the Association of American Physicians, both held at Atlantic City.

RUMANIAN MEDICAL CONGRESS

The first international congress of medicine to be held in Rumania took place in Bucharest from May 3 to 11. It was the National Congress of Medical Sciences, and had been arranged by the Academy of the Rumanian Republic. This Congress, held in a communist country, differed somewhat from similar congresses over here. It was organized at national level, with active support from the Treasury as well as of all the various departments concerned with the medical and scientific life of the country. Delegates were drawn from twenty-three countries, including Great Britain, and hospitality was on an unusually lavish scale. The meetings were followed by excursions, including a three-day steamer journey down the Danube, around the delta, and back.

The delegates from Britain were officially invited through medical bodies, such as the Royal Society of Medicine, who nominated them, and their stay in Rumania was made particularly agreeable. An interpreter-guide was appointed to each delegate, and from arrival to departure everything was organized most efficiently. In a country such as ours it is difficult to appreciate how smooth such arrangements can be, once the essential authority has been granted, and we envied our hosts' ability to jump the economic hurdles which surround any similar undertaking here. At the same time, although the munificence of the State was so apparent, it was equally clear that individual physicians, surgeons, and physiologists had worked long and hard to achieve success in what was for them a unique enterprise. The personal friendship extended to delegates was impressive, and the opportunity for individual discussion in the lobbies of the Congress hall was as great as over here. Apart from this, the organization was a rigid one, with the efficient guides shepherding their charges to the hospitals and institutions chosen for visits and demonstrations.

Scientific Contributions

The Congress mainly concerned itself with four fields of medicine: physiology, the rheumatic diseases—particularly rheumatic fever—neurology, and virology. These four sections met simultaneously, and there were joint meetings of welcome and farewell. The latter were remarkable for the many lengthy speeches of a general kind. The sectional meetings lasted with breaks from 8.30 a.m. to 7 p.m., and consisted of a long succession of 15-minute papers, read from typescript.

In the physiological section the weight of interest was upon the endocrine system, particularly the adrenal glands, the electrophysiology of the nervous system, and the application of Pavlovian theory to the study of behaviour. In the "rheumatic" diseases focal infection was still the main subject of study. As yet there is not the interest in the associated biochemical upsets which hold our attention in this country and the United States. In the field of neurology, led by Academician PARHON and Academician KREINDLER, interest centred particularly on the physiology of epilepsy and the basis of the neuroses where the application of Pavlov's doctrines is dominant. In neurology, too, the chief preoccupation was with the effects of endocrine activity upon the vegetative nervous system and with the study of neuronal activity resulting from experimental changes in adrenal function. In bacteriology and virology the approach was very similar to that here, under the leadership of Academician NICOLAU.

Prestige of the Academic Worker

Naturally, we were as much interested in the delegates attending the Congress as by their work. We were impressed by the intensity of their listening and by the enthusiasm of the speakers. As everywhere, the social and economic background colours the pattern of work. Whereas in Britain so many of us engage in academic activities against a background of routine medical practice, in Rumania the academic worker is highly specialized, more highly paid than the clinician, and he may enjoy an increase in his income because of the quality or the quantity of his scientific output. He receives much publicity, and throughout the Congress arc lights, movie cameras, and photo flashes were much in evidence. An important foreign delegate would give his paper with six arc lights a few feet away and two cinematograph photographers and several press men at very close quarters. The photographers even attended all the hospital visits. The pictures were used for the Congress newspaper, for the national journals, and for record purposes. We saw articles and photographs dealing with a similar congress in Hungary, and no doubt they appeared in the papers of other countries too. Though we were rather disconcerted with such publicity, our hosts seemed to accept it as usual and desirable. By contrast the evening meals, excursions, and entertainments