

TWENTY 'DON'TS' OF SCIENCE

It is a remarkable fact (writes Dr. James J. Walsh in *America*) that until comparatively recent years there has been a general impression that no development of science worth mentioning took place before our time, and that the biological sciences, and particularly such applied scientific departments as medicine and surgery, had utterly failed to develop. Indeed, many men, who thought themselves well-read and who were reputed well-educated, argued that since there had been no development of science before our age, there must be some strong reason for it, so they fixed upon the Church as the scapegoat. For she, it was assumed, was the power which prevented, or at least discouraged, all really scientific investigations. Here in America Professor Draper and President White, with this for a thesis, wrote books that are widely known and still widely read.

But we have changed all that. We know that the medieval universities, far from suppressing science in any way, were actually scientific universities. Above all, the medical schools of these old-time universities developed magnificently, and their text-books, which have recently been republished, are very valuable contributions to medical and surgical science. Though most of these works were first printed in the time of the Renaissance, they had been gathering dust on the shelves of libraries until a generation ago.

As a consequence of renewed acquaintance with these books all our ideas about the state of medicine and surgery, and regarding the development of the biological sciences in the Middle Ages, have been revolutionised. We know that often during the past eight centuries men have made remarkable advances in medicine and surgery, anticipating some of the great 'discoveries' only recently made. At the last meeting of the International Medical Congress a special section on the history of medicine was organised, because it was felt that that department not only presented details of interest to antiquarians, but because it enabled the present generation to face more critically many problems concerning the nature and treatment of disease, for much of the experience gained in preceding centuries had unfortunately been lost.

It is easy, therefore, to understand how many wrong impressions with regard to the history of science are now current. Instead of that almost universal neglect of scientific research, which had been supposed, there was, on the contrary, lively interest in such questions and those who write loosely about the history of science are sure to make even greater mistakes here than in general history. As the newer development of the history of science is even less generally known than the recent developments in political and educational history, editors, writers, and lecturers frequently fall into ridiculous errors because their knowledge is not 'up to date.' So these 'Twenty "Don'ts" of Science' are gathered together with the object of preventing 'educated' people from dropping into absurdities with regard to the history of science.

Don't refer lightly and confidently to a Papal bull which forbade the study of anatomy by dissection. The document referred to is easily obtained, and you will find that instead of the supposed prohibition of anatomy it is a wise hygienic regulation. (See *The Papers and Science*.)

Don't cite, though many have done so, a Papal bull forbidding chemistry, for when you read the text of that document it proves to be a statute prohibiting counterfeiting.

Don't quote the famous bull against Halley's comet. That bull has never been found. Within five years of the time when it is supposed to have been issued, Regiomontanus, often called the father of modern astronomy, was invited to Rome to become Papal astronomer.

Don't listen to that nonsense about ecclesiastical opposition to surgery. One of the most wonderful surgeons of history is Theodoric of Lucca, who was a bishop: the father of Modern French surgery, Guy de Chauliac, was a clergyman.

Don't hint that in order to make money by pilgrimages, relics, shrines, and prayers, the Church discouraged the development of medicine and surgery. The greatest list of scientific doctors in the history of medicine is that of the Papal physicians.

Don't fail to recall that Copernicus, the great founder of the Copernican theory, was a canon, owed his post-graduate education to the cathedral chapter, spent ten years in Italy, and was eternally grateful to his Italian masters.

Don't forget that pious scientists have existed. Linacre, the Englishman to whom medicine and scholarship owe so much, became a priest toward the end of his life.

Don't forget that the pious Galvani was buried at his own request in the habit of St. Francis, Ampere's favorite devotion was his beads, Pasteur was a devout communicant, Volta scoffed at the notion of having any doubts about faith.

Don't boast of our development of dentistry: the filling of teeth with gold and other metals, the capping of teeth, various methods of dental prosthesis and even transplantation of teeth are all old inventions.

Don't talk about sanitation as new. The medieval people made regulations that enabled them to get rid of leprosy when it was nearly as common as tuberculosis is now, and we shall do very well if we succeed in obliterating our folk disease as successfully as they did.

Don't forget to look up the pure food and drug laws of medieval Italy before boasting about our enlightenment in this matter. In those days the purveyor of impure drugs was hanged. A cheating druggist's stock was confiscated.

Don't boast of the perfection of our medical education until you read the laws of the Middle Ages. Before a young physician was allowed to set up for himself three years of preliminary work at the university were required and then four years at the study of medicine, besides an extra year's practice under a doctor or surgeon.

Don't quote the Galileo case to prove that the Church has hampered science as a policy. Cardinal Newman, whose logic is unquestioned and unquestionable, has suggested that if this is the only case that can be cited in 700 years, then it must be considered the exception which proves the rule. And Augustus de Morgan agreed with Newman.

Don't quote Galileo's *E pur se muove*: 'And yet it moves.' That expression was not heard of for considerably more than a century after Galileo's day, and is then found for the first time in the *seventh* edition of a French biographical dictionary, though it had not occurred in the Galileo article of the sixth edition.

Don't talk about Galileo's dungeon, nor his years of imprisonment. He never was in prison for an hour. He was sentenced to remain in the custody of a friend, and after a year his son was made his custodian. The principal part of his punishment—Poor man!—was the recital of the Seven Penitential Psalms every day for three years.

Don't think that science is explaining mysteries. Science multiplies mysteries, and the more we know the more we know that we do not know. Professor Ramsay, the great English physicist, says that as a young man he started out with the idea that he would never accept anything that he did not understand, but he found that it was almost impossible to meet with anything that he could fully understand.

Don't write about a knowledge of science as making more difficult a belief in a personal God. Lord Kelvin, the greatest of modern physicists, declared that science demonstrates the existence of a Creator.

Don't suggest that when a man knows a great deal about scientific medicine he loses his faith. Morgagni, Malpighi, Laennec, Johann Muller, the father of modern German medicine; Theodor Schwann, the father of the cell doctrine; Claude Bernard, the greatest of modern physiologists, and above all Louis Pasteur, the greatest contributor to modern medicine, were actually practical Catholics.

Don't forget the remark Dean Stanley made as he lay on a sick bed from which it was thought he would