

# Origins of Modern Science

A HISTORY OF SCIENCE, TECHNOLOGY, AND PHILOSOPHY IN THE 16TH AND 17TH CENTURIES. By A. Wolf, with the Coöperation of F. Dannemann and A. Armitage. New York: The Macmillan Co. 1935. \$7.

Reviewed by CHARLES ATWOOD KOFOID

MAN is both an inquisitive and an acquisitive animal; hence science and its applications. Historians of science have been wont to restrict the scope of their treatises to the discoveries and discoverers in the field of pure science and thus leave to others the story of invention and the applications of scientific principles in the arts, industries, transportation, and war. Each thus presents but a partial and incomplete picture of his field and both fail to portray the interactions of these two aspects of science each upon the other and the effects of both upon social organization and movements and upon culture and civilization. Thus, Darwin's theory of natural selection profoundly influenced philosophy, religion, nationalism, war, the class struggle, politics, business, and industry. The results of Mendel's garden experiments have not only stimulated cytology, genetics, and evolutionary theory, but they have also brought new colors into gardens and made it feasible to build up bigger and better capons.

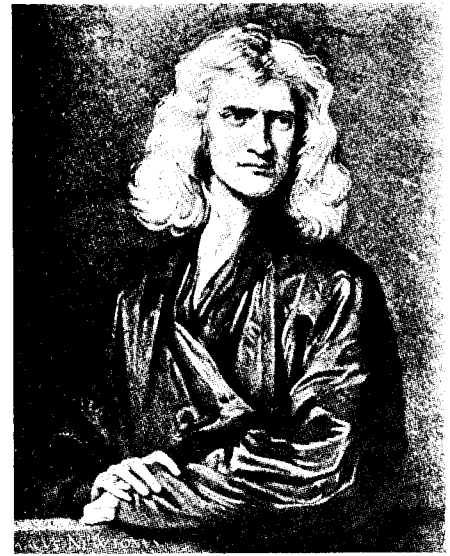
The causes of this unfortunate segregation are intricately complex. They include the vastness of the two fields and multifariousness of the essential data in each. Perhaps also the type of mind which can with effectiveness enter both fields and emerge with a well-proportioned treatise is rare, both in interest and experience. Professor Wolf, who fills the chair of the History and Methods of Science in the University of London, has undertaken this herculean task with happy results. He has limited the scope

of his volume to the two centuries in which the foundations of modern science were laid, the awakened 16th century and the 17th century of genius. He has also associated with himself in this laborious enterprise Dr. F. Dannemann, of the University of Bonn, the well-known historian of the biological sciences, and Mr. A. Armitage, an authority in astronomy and mathematics, as well as numerous other specialists in various fields.

Modern science had its heritage, and a rich one, too, from the past; but it was born when knowledge was freed from the impeding trammels of authority by the secularization of knowledge and it waxed strong as it was implemented with the tools of research. Scientific instruments made measurements feasible, invited experimentation, and laid the bases for comparison, verification, and criticism. Unbridled speculation gave way to hypothesis and proof, and theories were replaced by the laws of nature.

The telescope, microscope, thermometer, hypsometer, barometer, air-pump, pendulum, and the marine clock, the forerunner of the ship's chronometer, all began to amass data which called for discussion, demonstration, and correspondence which resulted in the organization of the academies. Among these were the Academy of Experiments in Florence (1657), the Royal Society of London (1662), and the academies at Paris (1666) and Berlin (1700). Henry Oldenburg, the first secretary of the Royal Society, reflected the spirit of these groups in his letter to Spinoza, in 1662: "Come then, excellent Sir, and banish all fear of stirring up the pygmies of our time; long enough have sacrifices been made to ignorance and absurdity; let us spread the sails of true knowledge, and search more deeply into the innermost parts of Nature than has been done hitherto."

The scope of the book is all-embracing, including Mathematics, Astronomy, Me-



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chanics, Physics, Meteorology, Chemistry, Geology, Geography, Biology, Psychology, the Social Sciences, Economics, Statistics, and Philosophy. The progress of technology is traced in medicine, surgery, pharmacology; in agriculture; in textiles, spinning, weaving, and knitting; in building construction, strength of materials, and building mechanics; in mining and metallurgy; in glass making; in mechanical engineering, hauling machines, water pumps, waterworks, ventilation, and mechanical drawing; in the steam engine; and in mechanical calculators, the abacus, Napier's bones, the slide rule, and calculating machines. The list of applications of scientific discoveries as yet unavailable would be even more significant than this imposing recital of accomplishments. It is noteworthy that the microscope had as yet done nothing for medicine or epidemiology, that transportation was still slow and undeveloped, that the home was still the factory, and that the burden of toil was still on men's shoulders.

Sins of omission abound in the nearly seven hundred pages of the book. Surely a place might have been found in technology for the printing press, even though no mathematical or mechanical principle of significance is embodied in it. One also desires to know the sources of the many fine illustrations which the author has not adequately documented. The brief chapter of thirty pages given to the biological sciences is largely biographical and not well integrated within itself or with the book as a whole. These defects, however, serve to accentuate the wide scope of the book and still more to reveal the importance which attaches to the subject which the author treats. Our own times with their perplexing catastrophes are the outgrowth of scientific and technologic developments which had their origins in these fateful centuries of the Copernican System, the Newtonian Synthesis, and the Cartesian Philosophy. The world has need of a new intellectual reorientation. Dr. Wolf's close study of the history of human thought and endeavor in its most objective spheres is a splendid beginning in this reorientation.

Charles Atwood Kofoid is professor of zoölogy at the University of California.



THE GREENWICH OBSERVATORY IN FLAMSTEED'S TIME

# Sponsor of Gothic

MY LIFE IN ARCHITECTURE. By Ralph Adams Cram. Boston: Little, Brown & Co. 1936. \$3.50.

Reviewed by AYMAR EMBURY II

RALPH ADAMS CRAM is one of that group of older men which raises a doubt as to whether the architectural school is worth while. When you consider that Cram and his former partner, Goodhue, Klauder of Philadelphia, Charles Platt, to mention only a few, became the leading architectural figures in America without ever having had any formal architectural education, and in some cases without even a good office apprenticeship, it becomes apparent that architecture is an art, not a science, and that a native talent is more important in good work than the best of training.

Dr. Cram, as he ought to be called since he is one of the few architects who has been honored by our universities with the doctorate degree, began his architectural career at precisely the time when architecture began to emerge from the apparently hopeless condition which persisted throughout most of the Victorian period, and became, even as a very young man, a leader in the renaissance of this great art. It must have been exceedingly difficult for the men of that period to find a way out of the wilderness. One Moses had already appeared, H. H. Richardson, who found a way, but unfortunately for most of his followers, the wrong one; a little later another group of prophets arose who, like the religious prophets, led their devoted followers each in a different direction, McKim toward the Classic, Louis Sullivan toward a new style, and Cram toward Gothic.

It is as yet uncertain whether, as Cram appears to believe, Gothic architecture will in the future persist side by side with other styles, its use restricted to those buildings, notably colleges and churches, for which it has such magnificent historical prototypes, both architectural and sentimental. We do know that such a persistence is not impossible. Some of the finest Gothic structures were erected during the Renaissance, and we today, separated from them by a couple of centuries, feel no anachronism exists. Even in the period of the Greek revival here in the United States, some very respectable Gothic buildings were erected, notably Trinity Church in New York, and Trinity Church in New Haven, and it may be that even if Gothic architecture always remains a sort of orchid on the tree of architectural life, it will have justified itself by the splendor of the structures which it has produced.

To this "Gothic revival" no one contributed so greatly as Cram, not only because of his work, but also because of his preaching and teaching. There is a saying: "Them as can do; them as can't teaches." If this is a rule, Cram is the exception that proves it, since, while like every architect's, his work has been somewhat uneven, the high spots cannot be surpassed. There is no Gothic nave in the world more beautiful than that of

St. John the Divine in New York, and this is by no means an archeological *tour de force*, but a logical use of Gothic motifs in a manner that no medieval architect had thought of. Cram thought Gothic.

Cram's practice, has, however, by no means been confined to Gothic work. He, like the rest of us, is unable occasionally to resist his temptation to stray away from what he believes to be his *métier*, and try his hand at designs derived from other historic forms, and one might add has even been able to persuade himself that he has been correct in doing so.

This ability to be on both sides of a fence and be right on both appears to be a characteristic of Cram which he himself recognizes. He tells that in his young days he became an enthusiastic monarchist, at the same time managing to be also a socialist, and explains it by adding: "I doubt if any one of us had ever read a line of Karl Marx, and most of us had not even heard his name. We were socialists because we were young enough to have generous impulses." It is this quality which makes Cram so interesting. He is still young enough to have generous impulses not only in life but in art, and his divagations have been not only the product of his generous impulses, but have justified themselves by the excellence of their results. He is always discovering something and is never satisfied until he gets other people to share with him. At twenty-three it was Venice, at thirty it was Greece, fifteen years ago

Mallorca, and last year it was Mexico, where he passed the winter at Taxco. He enjoys living as he does his work.

Naturally to the architect the most interesting feature of his book is Cram's reaction to the current modernist cult, and about this one finds him to be surprisingly tolerant, with a phrase which seems to me to be particularly true: "What to do now, when we no longer do anything instinctively; when a life without unity or consistency furnishes no creative impulse; when, by and large, we have only rudimentary and fluid ideas as to what constitutes beauty; when we have cut ourselves off for a century from any sort of living tradition; and finally when in our rather pathetic helplessness we have to rely on the broken (or at least very badly bent and equally unreliable) reed of the professional architect? This is, I admit, a very dubious question. I suppose we have got to begin again—pick up something of the lost social tradition, something also of the lost architectural tradition; but in doing so, I am perfectly sure that there are two agencies on which we cannot in any case rely, and these are the practitioner of 'period' design and the protagonist of a crazy and fantastic Modernism." Cram may be a traditionalist, but he is primarily the instinctive esthete in its real sense.

This is an interesting book by an interesting man about an interesting man, and yet it is not a conceited book or a vain book. It is hard to quote from because it is a mosaic of Cram rather than a photograph.

Mr. Embury, a New York architect, formerly taught architecture at Princeton.

## The Criminal Record

The Saturday Review's Guide to Detective Fiction

Title and Author	Crime, Place, Sleuth	Summing Up	Verdict
THE SEVEN SEAS MURDERS Van Wyck Mason (Crime Club: \$2.)	Shanghai, Algeria, Guatemala, and high seas echo with shots from Capt. North's trusty gat.	Secret service stuff, sprinkled with brave G2 men, slinky ladies, black hearted spies, devilment, and death.	Thriller
MURDER ISN'T EASY Richard Hull (Putnam: \$2.)	Mutually hateful British advt. agcy. trio re-induced 2/3 by poisoned tea. Insp. Hoopington reads diaries and solves.	Excellent as satire on admen generally: sinisterly amusing; clever as to method: but translucent as to "mystery."	A bit fragile
THE SPIDER'S TOUCH Valentine Williams (Houghton Mifflin: \$2.)	Young American embassy attaché suspected of treason is saved from redoubtable "Clubfoot's" clutches by daring quartet of adventurers.	Intrigue, action, and romance from the start with the elusive Doktor Adolf Grundt as fiendish (and as uncannily likeable) as ever.	Standard brand
THE DUMB WITNESS T. Arthur Plummer (Macaulay: \$2.)	Village benefactor slain. Corpus delicti vanishes but Andy Frampton and clever Schipperke find it.	Long drawn out affair with certain jarring notes—but as yarn of devil's work in small town it's engrossing.	Slow but satisfactory
DEATH STOPS THE MANUSCRIPT Richard M. Baker (Introduction by S. S. Van Dine) (Scribners: \$2.)	Pseudo-suicide of Hub savant doesn't fool pedagogue Franklin Russell, who models himself on Philo Vance with painful results.	Chief mysteries are Van Dine's foreword and dialect of Irish cops. Paraphrasing O. Nash, Franklin Russell needs a kick in the bustle.	Amateurish