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RESEARCH IN ENGINEERING¹

By Sir ALEXANDER GIBB, G.B.E., C.B., F.R.S.

ENGINEERING started as an art; at a later stage it developed into a somewhat scientific but purely empirical practice; it is now the final stage of applied science.

That engineering is a science has not always—and still in some quarters is not—recognized or appreciated, even among engineers themselves. For that we have no one to blame but ourselves. Too long were we content to act by the light of accumulated experience, not always fully assimilated. But engineering has now for some time past realized that, without research, progress and improvement are impossible.

Engineers have sooner or later always made use of the discoveries of science; but the connection with science has been casual and haphazard. "It seems exceedingly doubtful if Watt or any other inventor," wrote Professor Lea, "would have thought of the in-

dependent condenser, if it had not been for the fundamental work of a purely scientific character done by Toricelli, Boyle and others, on the pressure of the atmosphere, and that by Black and Watt which led to the discovery of the latent heat of fluids, and thus to a quantitative appreciation of the heat units involved in changing water into steam."

But organized research was then something still unknown. For the first fifty years of its life the Royal Society had to bear the jeers and sneers of the pulpit, the platform and the literary world. When Harvey published his tract describing the circulation of the blood it was received with ridicule, as the utterance of a crack-brained impostor, and he was deserted by almost all his friends. This attitude of distrust on the part of the public lasted into the nineteenth century. But scientific research was at last becoming a matter not only for the individual crank and dilettante, but for scientific cooperation. The encouragement of research and the advancement of useful knowledge were

¹ Address of the president of Section G—Engineering, British Association for the Advancement of Science, Nottingham, September 2, 1937.

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