

THE dialectical methods of the Middle Ages, admirably adapted to the sharpening of wits and the entertainment of audiences, have long been regarded by men of science as an inferior means of arriving at truth. I have no wish to enter into controversy with my friend Prof. Walsh as to the general merits of Aristotle. Yet I will venture to sum up in a sentence what I believe to be the conclusions of the overwhelming majority of modern Aristotelian scholars and of scientific men who have investigated the works of the master: *Aristotle's physical science is almost worthless from the modern point of view; it has scarcely any serious basis of observation and none of experiment; his biological works, on the other hand, show him to have been an admirable and careful observer of animal life.* He was thus an excellent naturalist but a very poor physicist. I will further endeavour to epitomise the verdict of most scientific students of the Middle Ages on his position in medieval science. *It was chiefly Aristotle's physical works that earned for him his scientific reputation in the Middle Ages; his biological works exerted little influence until the sixteenth century.* Those who assent to these propositions will not agree that "we have come to appreciate better medieval regard for him."

As regards Hugh of Lucca, I am aware of the existence of the "Chirurgia" of Theodoric, and that he was perhaps the son of Hugh, though, to my mind, Prof. Walsh has greatly exaggerated the scientific value of his work. But Theodoric's treatise, though certainly very interesting to us, was not greatly prized by the Middle Ages. Hence copies of it are very rare, and among the fifteen thousand or so medical MSS. that have survived in this country only one (Ashmole 1427, fourteenth century) contains it. A treatise possibly founded on it has survived in one English codex of somewhat later date (Magd. Coll. Cambridge, Pepys, 1661). Theodoric's treatise was not printed until 1498. I see nothing in it, or in what Prof. Walsh now says of it, to justify a modification of my criticism. The English reader who cares to learn more of Theodoric will find a sympathetic account of him in Sir Clifford Allbutt's "Historical Relations of Medicine and Surgery," and a very full analysis of his "Chirurgia" in E. Gurlt's "Geschichte der Chirurgie."

The judgment of the Renaissance printers in their selection of medical works is a matter of opinion. The sixteenth century had run a quarter of its course ere they made Hippocrates accessible (earliest Latin edition, Rome, 1525; earliest Greek edition, Venice, 1526). By that time the ponderous "Kanun" of Avicenna had already passed through at least twenty-two editions (Editio princeps, Strassburg, 1472). Those who rate Hippocrates higher than Avicenna—or than Theodoric—will rate the judgment of the Renaissance printers—and readers—accordingly.

Against Prof. Walsh's suggestion that I am opposed to any good being said of the Middle Ages I am sufficiently protected by my published works. However these be estimated, they will yet, I hope, guard me against the accusation of having neglected that period. Under such protection as they may afford I would add my regret to that of many of Prof. Walsh's other admirers that he does not use his great learning and literary gifts to portray medieval life as it was instead of as that of a *Civitas Dei*, which it was not. Whatever the scientific aspirations of the age, the scientific achievement was very small. The explanations of this failure are various, but in denying the fact Prof. Walsh belongs to an exceedingly small band of scholars whose conclusions seem also, to some of us, to be shaped by certain preconceived

ideas. But we shall not, on that account, value the less any contribution to knowledge that he may make. Oxford, June 12.

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Commercial Parasitism in the Cotton Industry.

THE opinion of Sir George Watt in NATURE of February 23 that the report to the Board of Trade of the Empire Cotton Growing Committee is "ingeniously elaborated," but leaves a "confused impression," may justify a brief consideration of an allied phase of the subject. Why "the whole history of cotton improvement is most disheartening" may be explained if an essential feature has been omitted. The argument for research is ably presented in the pamphlet issued at Manchester by the Provisional Committee on Research and Education for the Cotton Industry, but with no reflection of the actual state of production.

Not only should planters have industrial information, as recognised in Sir George Watt's proposal of a central research institution at Manchester, but on the part of manufacturers, financiers, economists, and commercial leaders there is acute need of agricultural information. Industrial interest in cotton improvement must be made effective through the commercial channels that lead back to the farmer. Problems of agricultural application must be solved, in addition to developing superior varieties, devising better cultural methods, and controlling diseases or insect parasites. The elaboration of the cotton research programme may be entirely logical, but without an effective tie-back to the farmer there can be no prospect of a general application of the results of technical investigation, either industrial or biological, to purposes of production.

The central cotton institution at Manchester should be equipped for any elaboration of research that may be necessary to determine and demonstrate to manufacturers the relation of the system of buying to the improvement of production. The parasitic tendencies of the present commercial system are not limited to the speculative features that are being restricted by law or to the taking of undue profits, but lead to enormous agricultural and industrial waste through the production and manufacture of inferior fibre, passed on to the consumer in weaker and more perishable fabrics.

To expect manufacturers to be interested in the cotton plant or in the details of farm operations in the growing of cotton might be unreasonable, but at least the financial aspects of cotton production would receive attention if manufacturers knew how their interests are prejudiced by the present commercial system. Instead of serving as a conductor of interest in improved production from the spinner to the farmer, the commercial system has the manufacturers and the growers fenced apart and misinformed regarding the general needs of the industry.

Manufacturers are accustomed to pay more for good cotton, and naturally suppose that the farmers who raise better fibre receive higher prices for their crops, but investigation will show that most of the profit is absorbed by the buyers. The commercial idea of improving cotton is by "classing" the present miscellaneous crop into the so-called "even-running lots." Buyers like to get long-staple bales at short-staple prices, but do not forgo present profits in order to encourage the improvement of future crops that somebody else may buy. The commercial system provides no incentive for improved production.

The farmer is at liberty, of course, to raise better cotton if he chooses, but extra care and expense must be given, with no assurance of being able to sell at a higher price. Instead of gaining an advantage or of being encouraged to continue the planting of a better