Letters to the Editor.

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Scientific Work: Its Spirit and Reward.

THE true incentive of the scientific worker is his work. Through his work he expresses the creative thought within him, which he feels to be his highest life. This expression must through its very nature be free, otherwise he becomes a slave in the worst sense, in that the free exercise of intelligence is denied him.

Because this freedom is sacred to the scientific worker he sometimes has to sacrifice income and the possibility of family life to retain it, but this is a mere misfortune, not in any sense a necessary concomitant of scientific ability. The sentimentalist and the exploiter have promulgated the idea that the scientific worker, being exalted above the need for normal human joys and amenities, works best on the smallest possible income; or, having found that this does not always work out in practice because it tends to reduce the output of useful results, as the reduction of rations to one bean per day led to the unfortunate demise of the horse, the opposite line is taken, and it is supposed that by large remuneration the valuable work looked for can be bought.

Neither the one nor the other point of view is correct. The scientific worker if he is normal needs the means to enable him to have a happy, care-free home-life, and to educate his children in such a way that they in turn may be free as he would be. Therefore to starve him is to eliminate the normal and consequently intelligent worker in favour of the eccentric. For let it be clearly stated, the highest intelligence is always supremely sane. The idea of a scientific worker as a harmless lunatic is by no means confined to sensational fiction, although it might as well be imagined that every long-haired user of a piano is a Paderewski, or every loose-tied splasher of paint on canvas a Sargent.

On the other hand, to believe that creative thought can be purchased with money is to repeat the mistake of Simon Magus. Imitative thought in all its manifestations can be obtained for an adequate remuneration, because it can be produced by outward drill, discipline, and experience. So experts in the orderly routine dear to the official mind can be turned out by mass-production like cheap crockery, and are similarly useful and indispensable.

There is however, no means of estimating the value of one really original thought either in pure or in so-called applied science. Certainly the possession of anything like its value in money would often be an embarrassment to the scientific worker through whom it is expressed. He also would be the first to disclaim any absolute or exclusive right to it. In the last analysis, humanly speaking, there is no such thing as an absolutely original idea, and it is seldom that any single individual can claim undivided credit for bringing a new idea to birth.

On the other hand, to divide its money-value, if it have any in such a way that little or nothing comes back to the immediate originator is simply unjust, and therefore ultimately disastrous.

A certain type of person sniffs at Lord Kelvin for having become part owner of numerous important patents. No one will deny Lord Kelvin's position as a scientific worker; that he was also a business man merely means that his gifts were more readily applied to the good of humanity.

That a scientific worker should be debarred from any reward or protection by patents embodying his discoveries, because of his occupying either a public or private salaried position, is not only unjust, but also often unbusinesslike and against the public interest. The equitable adjustment of rights and returns as between public or private capital and the actual inventor is often the only way to prevent exploitation by purely selfish private interests.

To repeat, the true incentive of the scientific worker is his work. Salary, kudos, position, *esprit de corps*—these are incentives to good and useful people, but they are not the true incentives of the real scientific worker. To obtain the best from him, he must before all things have freedom, and, if possible, also a reasonable measure of justice.

"The bearings of this observation," as Capt. Bunsby in "Dombey and Son" remarked, "lays in the application on it."

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Applied Science and Industrial Research.

AT a meeting held at the Birkbeck College on April 28, organised by the National Union of Scientific Workers to urge more public support of scientific research, Prof. Soddy, the principal speaker after Mr. H. G. Wells, who occupied the chair, made a strong attack on the Department of Scientific and Industrial Research and the industrial research associations which have been, and are being, established under its ægis (see NATURE for May 6, p. 309). As much of Prof. Soddy's criticism seems to lend colour to current misconceptions of industrial research and of the functions of the research associations fathered by the Department of Scientific and Industrial Research, I beg the hospitality of your space for the following observations.

No one disputes the vital and urgent need for increasing the facilities for scientific study and scientific research. All those who know the facts will echo Mr. H. G. Wells's just indignation at the national neglect of science and the half contemptuous treatment by the State of our great men of science. I go further and agree with Prof. Soddy that in the extension and intensification of scientific study and research the claims of pure science must be primary and paramount. But I deny emphatically that this involves a similarly short-sighted and contemptuous attitude towards the needs of applied science and industrial research. If English industry has suffered too long from the dominance of mere rule-of-thumb methods; if our manufacturers have, through ignorance, underrated the value of science, the fault has not been wholly and exclusively theirs. The academic people who have contemned applied science and industrial technology as something little better than a crude empiricism must bear some share of the blame. The manufacturer may have kept his feet too much in the mud; the academician has too often kept his head entirely in the clouds. If one has been too disdainful of scientific methods that did not ensure or promise immediate dividends in cash, the other has talked at times as though the mere prospect of a utilitarian issue to a specific research were enough to defile it and make it unworthy of his serious attention. We all know the type of academic science worker to whom an investigation of the internal structure of the atom is a noble and purifying pursuit, and