complained not only of inadequate funding for such ventures[32] but of blatant indifference to the opinions of concerned scientific workers as well[33]. Finally, it should be noted that *Nature* was not entirely negative in its judgment upon the state's administrative agencies. It warmly praised, for instance, the reforms of the Post Office[34] and the Patent Office[35] enacted in 1932 and the Ministry of Agriculture in 1933 (ref. 36).

The one institution which never fell from *Nature*'s grace was the Department of Scientific and Industrial Research. However uneven its progress, Gregory believed the department would one day act as the catalyst for the expansion and reorganization of British industry. Its early failures were therefore attributed to industrialists ignorant of the value of industrial research. "St. Paul may have been amenable to quick conversion", J. W Williamson surmised in 1929, "but the average British manufacturer is, shall we say, less impetuous"[37]. Such criticism, though, occurred less frequently in the 1930s. Thus Brightman was convinced in 1932 that, although industry had been deficient in a scientific outlook, "this tendency is passing"[38]. Four years later he concluded from the DSIR's annual report: "Evidence is to be found everywhere in industry that the importance of applying . . . the help that science can afford is widely realized"[39].

Unfortunately it cannot be determined whether Gregory believed that the attitude of labour leaders had undergone a similar transformation. In the 1920s, however, Sir Richard had chided the trade unionist who "concentrates upon inequalities in the distribution of wealth and neglects to take its production into consideration", because he presented "the same attitude to progress as does the industrialist whose outlook is limited by what he can observe now, and who sees no profit in the extension of it by research"[40]. Such perspectives may have been similar, but did he believe one to be more pernicious than the other? *Nature*'s leaders on the coal industry contended that, in this area at least, labour presented the greater impediment to progress. While the colliery owners were scolded for the non-support of their own research association[41], it was the miners' strikes which were principally blamed for Britain's decline in the world coal trade[42]. The remedy which the journal offered for the industry's ills was "MORE WORK"[43]. It is doubtful whether Gregory would have so apportioned the guilt in every other problem industry.

As radical as certain of the criticism may have appeared, none to this point has necessarily implied any serious alterations in the nation's socio-economic structure. It was only during the Depression that Gregory was led to question even the essential of a private enterprise economy. At first Brightman and he saw the economic crisis as simply one further manifestation of the absence of a scientific outlook in public affairs[44]. The persistence of widespread unemployment and malnutrition, however, eventually persuaded Sir Richard and his associates (for a brief time) that "science in the service of man, aided by capitalism mainly in the service of the few, has done wonders for production, but it has yet to solve the problems of exchange and distribution"[45]. A spread of the scientific outlook would therefore only be a partial and long-term solution. As early as 1933 Brightman could suggest: "It is no longer merely a question whether effective measures could be taken if those in authority possessed sufficient knowledge and understanding of the situation, but whether the present system permits them to take any effective action without the whole system being radically reformed"[46]. When Gregory's convictions about both the inefficacy of liberal democracy and the inefficiency of administration and industry are coupled with his doubts about the feasibility of capitalism, it would be difficult to imagine his advocacy of any course short of social revolution. What alternatives were in fact proposed in the *Nature* leaders?

The Scientific Society

Gregory admitted to Wells in 1905 that, "completely dissatisfied with the habits and institutions established around me, I find pleasure in looking forward to the world of the future"[47]. In the view of Gregory and his fellow writers such a world would be a far saner and more productive environment that the static one of the 1930s. "If

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Reprinted from Nature, June 17, 1933

Fine-Structure of the Ionosphere

I WAS much interested in the letter by Messrs. Schafer and Goodall in NATURE of June 3 dealing with the results of their experiments on the radio exploration of the ionosphere in the United States, since an independent set of observations in Great Britain, which are dealt with at length in a paper now awaiting publication, have led to very similar conclusions.

The method[1] used in the British series of observations has been to measure the maximum ionisation content of the various upper atmospheric regions by finding the critical penetration frequencies.

The British series of observations suggests therefore that there are four main components in the ionosphere caused by the influence of ultra-violet light from the sun. Such a composite structure is not considered unlikely when it is remembered that Pannekoek[3] has shown that the level of maximum ionisation caused by ultra-violet radiation depends on the ionisation potential of the gaseous constituent. It is tempting to associate the four components with the four ionisation potentials of oxygen and nitrogen atoms and molecules, and the suggestion that F^{II} is due in this way to oxygen atoms and F^{I} to oxygen

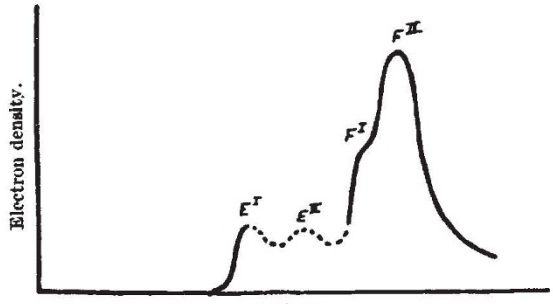

FIG. 2.

molecules has, indeed, already been made by T. L. Eckersley[4], who independently obtained evidence indicating a dual structure for region *F*.

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