sun his time standard would not be that determined by bodies he had carried with him, but the standard found by observing from the sun similar bodies on the earth, and he would judge that his time standards were changed by being displaced. Of course, if they were not changed, the spectral shift would be zero. The colour analogy, however, shows that there is no special reason to believe that they are unchanged, and it certainly seems most likely that the invariable quantity in such a displacement is ds, for this is already known to be of fundamental importance in other problems. The shift, therefore, is probable, though if it were absent it would not be very difficult to construct a theory that would fit the fact.

If it were true that dt was the same for atoms on the sun and on the earth, we might expect our standards of length also to be the same; but this leads to a surprising result, for if they were, the measure of the wave-length of the emitted light would be proportional to $(g_{44}/g_{11})^{\frac{1}{2}}$, so that it would not be possible to continue to use the wave-length as a standard of length; thus such a hypothesis would lead, not to a simplification, but to an added complexity. It may also be noted that the spectral shift depends on the part of Einstein's law that agrees with Newton's, so that the two stand or fall together if this phenomenon is crucial.

Einstein's law, however, rests on firmer ground than the theory of the spectral shift. As to whether this shift exists, the available data on an average point to one of nearly the predicted amount, and are certainly much nearer this than zero. They show a great variation in the amount of the shift, which must be explained before the question can be regarded as solved. Many causes are capable of producing this variation, but what seems to me likely to be the chief does not appear to have received much attention. The prediction rests on the assumption that the vibrating atoms are in similar surroundings, which is plainly false. It is, indeed, required by the theory of stellar evolution that the whole constitution of a star must alter owing to successive types of atom becoming unstable and passing over into more stable forms. Instability demands that the slowest free vibration of the atom has its frequency reduced to zero, and in the process the other periods must be affected. The remarkable fact is not that there are shifts, but that the observed spectra are as much like terrestrial ones as they are.

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The Position of the Meteorological Office.

THAT the study of the atmosphere and the practical applications of meteorology should be supported and encouraged by the Government is a proposition so obvious that it is accepted in every civilised country. It does not, however, follow that the meteorological service of a country should be conducted as a branch of the civil service, still less of the military service, and British meteorologists must be grateful for the emphasis laid in the leader in NATURE of February 26 on the importance of scientific control of official meteorology.

I do not know enough of the present constitution of the Meteorological Office to offer any criticism of the Air Ministry in relation to it, but I am very strongly in agreement with the resolution of the Royal Meteorological Society as to the importance of full inquiry before changing the constitution of the Meteorological Office, which has led to such remarkable advances in meteorological science since 1905. The transfer to the Department of Scientific and Industrial Research, which you state to have been contemplated at one time by a Committee of the Cabinet, would, it seems to me, have been a natural development of the constitution under the Meteorological Committee, and it would have been free from the dangers to scientific progress which are, not unnaturally, feared from a subordinate position in the Air Ministry. Had a full inquiry been held, I doubt whether the claims of the Air Ministry would have been preferred to those of the Board of Agriculture and Fisheries, the Admiralty, the Board of Trade, and, in particular, to those of the Ministry of Health. The union of the British Rainfall Organization with the Meteorological Office has altered its centre of gravity so far as to make its equilibrium less stable in the Air Ministry than it would be in either the Board of Agriculture and Fisheries or the Ministry of Health. As part of the Department of Scientific and Industrial Research the Meteorological Office would be in neutral territory, and could be equally serviceable to all the great Departments, each of which would naturally be represented on the Advisory Committee controlling the organisation. The position would then be analogous to that of the Geological Survey, which, perhaps, is the official scientific body most nearly akin to the Meteorological Office.

For scientific bodies of this kind freedom from all unnecessary trammels of officialdom is necessary in order to permit the expansion and development which are essential to healthy life and practical usefulness; and in a body of such universal usefulness as the Meteorological Office in its present expanded form some representation of the industrial and economic applications of meteorology upon the advisory committee or other controlling board is nearly as important as the representation of independent men of science.

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March 2.

THE issue of NATURE for February 26 contained an account of the Royal Meteorological Society's resolution in reference to the transfer of the Meteorological Office to the Air Ministry, a leading article dealing with the same subject, and correspondence on the organisation of scientific work, part of which seems directly applicable to the same theme.

If it be true that the Meteorological Committee is no longer to exist, the society's protest appears amply justified. Otherwise the position of the Meteorological Office as a branch of the Air Ministry, with a scientific advisory committee, would appear not very dissimilar to that of the Natural History Museum; or perhaps a better comparison would be with the Royal Observatory, Greenwich, which is under the Admiralty, the Astronomer Royal being supported by a scientific advisory committee in the shape of the Board of Visitors, of whom only one, the Hydrographer, directly represents the Admiralty, the rest being either university professors of astronomy or else expressly nominated by the Royal Society or the Royal Astronomical Society.

The Meteorological Department at Greenwich, though now in its eightieth year, is too recent to expect direct representation on the Board, especially as its activities have not generally run in the direction of research, but the fact remains that the work at Greenwich has points of contact not only with the Admiralty, but also with the Board of Trade, the Post Office, the Meteorological Office, the Colonial Office, and other bodies. It ought not to be impossible to