Science and Intellectual Freedom.

IN the issue of NATURE for July 18, p. 103, it is stated: "Our sole object in taking up the subject of the prohibition of the teaching of evolution in certain States of the United States, and in inviting opinions upon this action from a number of leading authorities, has been to afford support to our colleagues fighting for scientific truth and progress against dogma and stagnation. We trust that the additional messages subjoined will give them the strength and courage they need to secure for them the position of intellectual freedom established in Great Britain many years ago, and existing unchallenged to-day."

It is possible to appreciate the good intentions of this patronage without admitting its need. Not intending to bite the hand that feeds us, I still venture to express a doubt as to whether the strength and courage of American men of science in their efforts to attain the intellectual freedom established in Great Britain will be greatly forwarded by the series of little articles published in NATURE and by the editorial comments.

Tennessee is the only State concerned, and it does not forbid the teaching of evolution, but only the teaching in tax-supported institutions of the derivation of man from a lower order of animals. The law is unfortunate, and is opposed by general public sentiment as well as by men of science. It should, however, be remembered that Tennessee also forbids the reading of the Bible in its public schools; it does not expect them to teach that the evolution of man is not true. The control of teaching by legislation is unwise, but no sensible teacher would want to lead children to question the religious convictions of their parents. Intellectual freedom is also interfered with when a premier prescribes that the children of a nation must study Latin, thus leaving no time for the study of science.

There is a larger proportion of "Fundamentalists" in every European nation than in the United States, and also a larger proportion of educated people who profess, without believing, the thirty-nine articles and other inherited creeds. Sir Joseph Larmor, the distinguished man of science who represented the University of Cambridge in Parliament, made it one of his chief pleas when he was first a candidate that he would support the maintenance of the control of the Church of England over tax-supported schools. It is not surprising if a majority of the rural population of Tennessee hold the creed that Mr. Gladstone defended and that Lord Balfour exploits in more sophisticated fashion. They would scarcely follow the vagaries of Sir Oliver Lodge. The only scientific man here who manifests an interest in such things was sent to us from the University of Oxford. But perhaps it is undesirable to make international comparisons.

J. MCKEEN CATTELL.

New York, July 30.

On the Spectra of Neon and Argon in the Extreme Ultra-violet.

AT the April meeting of the American Physical Society (see *Physical Review*, 25, 886, 1925) we reported the existence of a very strong pair of lines in the spectrum of neon at λλ 743·78 and 735·95, together with some ten other lines, all combinations with a fundamental $1p$ term in this spectrum. We are glad to see that G. Hertz (*Die Naturwissenschaften*, May 29) has independently found the same strong pair, and that their position agrees satisfactorily with our measures and with that obtained by him from resonance potential observations.

It is perhaps worth while to note that the spectrum of argon contains a similar pair, at λλ 1048·28 and 1066·73 (±0·2), together with a number of other lines of shorter wave-length, which are probably components of a like pattern. The strong pair fits exactly the resonance potential, 11·5 volts, found by Hertz. Another observed pair corresponds to his value of 14·0 volts. His third resonance potential, 13·0, seems not to correspond to any emission line, but the presence of unidentified impurity lines in our spectra makes it necessary to take further observations before giving final data.

The complete argon spectrum is probably like that of neon. The strong lines are therefore combinations of a fundamental $1p$ term with terms $1s_2$ and $1s_4$. The latter combine with other terms, as yet unknown, to produce several lines which are listed in tables of constant wave-number differences (*e.g.* Kayser, "Handbuch," 7, p. 26, where two of the columns refer to such combinations). More observations on the spectrum of argon are, however, needed before the structure of the spectrum can be worked out.

In neon a curious fact has been noted. The line at λ735 is normally stronger than that at λ743; it is in fact the strongest line in the whole spectrum. When, however, a small quantity of neon is present as an impurity in helium, the relative intensities of the lines of this pair reverse, λ735 becoming the weaker of the two. Our observations make it seem unlikely that this could be due to the presence of a sharp-edged absorption band in our helium. One would therefore suppose that collisions between atoms of neon and of helium render the peculiar atomic state yielding the line λ735 less probable than is the case when the neon is alone. Argon as an impurity in neon shows no such effect.

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Lunar Periodicity in Obelia.

IN Proc. Roy. Soc., vol. 95, 1923, Mr. H. M. Fox directed attention to a number of cases of "Lunar Periodicity in Reproduction" in marine organisms. To these may be added the hydroid *Obelia geniculata*. At first sight the periodicity is masked by the irregular breeding of colonies which are wave-worn or much eaten down by nudibranchs, but if attention is confined to healthy and perfect colonies, the lunar periodicity seems quite definite. During 1924 several colonies on the piers were located and watched; the best result was from a colony on Laminaria on Millport old pier, which was giving off medusæ during the ten-day periods beginning with the third week of the moon in July, August and September, and not at other times. Other colonies gave definite results in two consecutive months, but were then attacked by nudibranchs or lost.

More recently, twelve colonies at Keppel were examined on July 28 (first moon quarter)—none of them had gonothecæ, one colony had minute axillary buds beginning to form gonothecæ; on August 5 (full moon August 4)—of fifteen colonies examined, eight were worn, frayed or eaten, the remaining seven were healthy and ripe, including small colonies of only five or six branches, probably three weeks old.

Miss S. M. Marshall has confirmed these observations by noting occasional abundance of Obelia medusæ in the plankton about the third quarter of the moon. Colonies which have been much eaten by nudibranchs may, if abundant food be present,