

LETTERS TO THE EDITORS

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Tchnetium: the Element of Atomic Number 43

IN 1937, Perrier and Segrè showed that radioactive isotopes of element 43 could be formed by neutron or deuteron bombardment of molybdenum¹. Several chemical properties of element 43 were established at that time, and some nuclear properties of the spectral isotopes. These isotopes were found after nuclear bombardments by the 37-in. cyclotron of the Radiation Laboratory of the University of California.

Later on, Wu and Segrè found also element 43 among the fission products of uranium, a source from which relatively large amounts of 43 can be isolated².

It seems appropriate now to give a name to this element, as suggested by Paneth³; and we would like to propose the name of 'technetium', from the Greek τεχνητος, artificial, in recognition of the fact that technetium is the first artificially made element. The corresponding chemical symbol should be 'Tc'.

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¹ Perrier, C., and Segrè, E., *J. Chem. Phys.*, **5**, 712 (1937); **6** (1938).

² Segrè, E., and Wu, C. S., *Phys. Rev.*, **57**, 552 (1940).

³ Paneth, F. A., p. 8 of this issue of *Nature*.

Astatine: the Element of Atomic Number 85

IN 1940, we prepared the isotope of mass 211 of element 85 by bombarding bismuth with alpha particles accelerated in the 60-in. cyclotron of the Radiation Laboratory of the University of California¹.

At that time we established several chemical properties of element 85 and we made a fairly complete nuclear study of the isotope formed.

It has been pointed out to us² that a name should now be given to this new element, and following the system by which the lighter halogens, chlorine, bromine and iodine, have been named, namely, by modifying a Greek adjective denoting some property of the substance in question, we propose to call element 85 'astatine', from the Greek αστατος, unstable. Astatine is, in fact, the only halogen without stable isotopes. The corresponding chemical symbol proposed is 'At'.

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¹ Corson, D. R., Mackenzie, K., and Segrè, E., *Phys. Rev.*, **57**, 1087 (1940).

² Paneth, F. A., p. 8 of this issue of *Nature*.

British Universities and 'Secret' Theses for Degrees

IN his presidential address to the Royal Society, Sir Robert Robinson is reported in *Nature* of December 7 (p. 825) as having said, "Nevertheless, the universities have preserved intact their precious liberty of action, and I see no signs of any attempt to curtail it. Surely this suggests a feasible line of demarcation in that extra-mural contracts, placed by Service departments with the universities, need not, and should not, contain any clauses restricting free publication of the results. Although it has sometimes been irksome, the refusal of many universities to accept theses that cannot be published is a step in the right direction."

Whatever the views and practices of the Defence Departments may have been in the pre-war and war-time years, it is certain that those now responsible for the organisation and direction of defence research in Great Britain are as genuinely interested as academic scientists themselves in the maintenance of complete independence and liberty of action for British universities in the field of scientific research. Within the last year, defence science representatives have met to pool their views on policy in the placing of extra-mural contracts, and were unanimous in deprecating any form of pressure on the universities to accept research contracts of the kind which seem likely to lead to unpublishable results.

But Sir Robert Robinson's commendation of the refusal of many British universities to accept unpublishable theses must not pass unchallenged. Since no scientific worker doing research in a university laboratory should be producing unpublishable results, there should arise no demand on universities to grant 'internal' degrees based on secret theses. The undertaking of research in a university laboratory is, however, not an invariable requirement for the award of higher degrees such as M.Sc., Ph.D., and D.Sc., and the refusal to award such degrees to 'external' scientific workers on unpublishable results deprives the young research worker entering a Government defence laboratory of any assured opportunity to submit the results of his research for a higher degree.

Non-acceptance of unpublishable theses by universities thus becomes a serious handicap to recruitment of scientific men for defence research. In addition, it is a potential handicap to the defence research worker whenever he may seek return to a university or industrial scientific career, for there is no denying that the possession of a research degree is an asset when seeking a scientific appointment, and it is likely to be the more needed if, for security reasons, one is prevented from describing one's research achievements in detail.

Bearing in mind how seldom it proves impossible to distil the scientific essence of a defence investigation from those operational aspects and implications which must remain secret, I would estimate that not more than four or five scientific men in defence establishments would wish to submit unpublishable theses each year to universities in Great Britain, and most, if not all, of these theses would become publishable within the space of a few years. The injury to national defence by refusal to accommodate these few scientific workers on an equal footing with colleagues in the academic and industrial world is surely disproportionate to any slightly harmful reaction upon the universities which the idealist may discern.