Chemical Detection of Artificial Transmutation of Elements

IN NATURE of May 6, p. 652, a communication by Prof. F. A. Paneth and P. L. Günther was published on the application of chemical analysis to the study of processes of artificial transmutation of elements.

Similar work has been carried on by us in Moscow since 1931. Appropriate technique was developed and necessary apparatus was devised which made it possible to analyse the gaseous products of atomic disintegration, even when a single α -particle out of 2,000,000 resulted in destruction of the atom. Such a high precision was attained through isolation of helium arising from α -rays, generated by the process of disintegration of the radioactive material. Preliminary reports on this work were made by one of us at the Moscow House of Scientists in January and June, 1932.

The study of the disintegration of aluminium by α -rays which was conducted by the gas-detection method, has revealed the formation of greater quantities of hydrogen than those formed by the scintillation method. Preparations of very strong α -rays have been used in these experiments.

Experiments involving bombardment with β -rays from very strong radium emission preparations on lithium and sodium iodide have proved the formation of traces of helium in the first case, and that of traces of helium and neon in the second. Similar experiments with potassium iodide gave negative results as to formation of rare gases. In experiments with potassium the emission of small quantities of hydrogen was noticed, even without the action of β -rays; this suggests the possibility that the hydrogen is continually being formed from potassium, and represents the products of its radioactive decomposition. Certain geochemical data may be quoted in support of this suggestion, namely, that natural gases from potassium salt deposits usually contain hydrogen, while all other natural gases do not.

Verification of the results reported above is being carried out.

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Co-operation in Science

I AM glad to see that Mr. Gomme (NATURE, Oct. 14, p. 606) is so nearly in agreement with me. The general adoption of the Universal Decimal Classification by abstracting and indexing services would yield a consolidated index to scientific and technical literature. But it would not suffice to remove existing overlapping and gaps. It would be necessary that each periodical should be indexed completely, instead of extracted for papers on a special subject as now happens.

All the important papers in a periodical would be catalogued. Those coming within the scope of a particular bureau would also be indexed or abstracted by that bureau. The titles of the rest would be sent to the various bureaux specially concerned, or to a clearing house for distribution. Thus each bureau would receive titles of all papers within its field for indexing.

The co-ordination of this work needs a classification, as was recognised by the compilers of the International Catalogue of Scientific Literature.

The U.D.C. is only a means to an end. This end is the full co-operation of scientific workers themselves, not merely that of abstracting journals. Such co-operation can only be achieved through a comprehensive index. The U.D.C. is the most economical system at present known. Its use costs one-twentieth as much as abstracting. Afterwards the preparation of annual indexes can be entrusted to unskilled labour. The material for the annual indexes can be cumulated and used without change for long-period indexes, thus eliminating the huge cost of the compilation of such indexes. Nor does the introduction of decimal numbers interfere in any way with the use or form of abstracts as at present. It would merely make them more useful.

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References in Textbooks

IN several recent contributions to NATURE, reviewers have reproved authors because a majority of their references were to works of their compatriots. I submit that such criticisms, standing alone, are apt to be very misleading, except possibly in regard to bibliographies which are not concerned here.

Omissions of subject-matter may, of course, be fitly criticised. In encyclopedias and some works of original learning, where the treatment in the text does not profess to be complete, the omission of a reference may be in effect the omission of subject-matter. But since the gravity of the offence varies greatly with the importance of the matter omitted, criticism on this ground should always be supported by specific examples; nationality is irrelevant. In works of instruction an author is not expected to give references to matter treated fully in the text, because the purpose of his book is to save the reader from going to the original literature. His references should only be to matters treated incompletely in the text; they should be to the most easily accessible sources, which will usually be the work of a compatriot. What reviewers in NATURE have condemned as a fault, they should often laud as a merit.

That these obvious facts are not recognised is due, of course, to the present obsession of scientists with the idea of 'credit'. It is regarded as a misdemeanour to state any fact without mentioning the name of its discoverer, and as a felony to associate the fact with any other name. If the primary object of all scientific writing is the acquirement or proper allocation of 'credit', the reviewers are perfectly right. But it should be recognised that the acceptance of that view must inevitably lead to the suppression of textbook authors, who try to pass the whole of their subject-matter through their own minds, thereby welding it into a coherent whole, devoid of its original particularity, and to the encouragement of those who merely vomit at their public the undigested contents of a mechanically compiled card-index. Is that really what is wanted?

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