consortium should be empowered to implement any proposals falling within the powers of the authorities constituting it; to encourage and facilitate appropriate action by other bodies; and to develop support among other bodies and the general public for the policies and measures proposed. It should maintain close working liaison between the interests concerned and create new facilities for the public enjoyment of Broadland within the strategy of the Conservancy's *Report*, as well as maintain constant review of trends and developments in the area and initiate action to obtain data on them. It should also detect and appraise gaps in the powers required to implement fully the agreed policies, and advise on the economic implications of these proposals.

RADIOCHEMICALS

FOUR booklets have recently been issued by the Radiochemical Centre, Amersham*.

The first, *Selected References to Tracer Techniques*, is a revised edition and contains a bibliography of selected publications useful to newcomers to tracer work. The contents consist of titles of general texts and articles dealing with the preparation of labelled compounds, tracer applications, methods of measurement and safety precautions.

Radioactive Isotope Dilution Analysis is a second edition of the booklet in which the principle of the analysis is explained and shown to be a sensitive method of determination of many substances in mixtures. It is emphasized that the technique does not require expensive laboratory facilities or materials. The application of the method is illustrated by particular examples.

Problems of radiation self-decomposition of materials are of increasing interest to users of radioactive tracer compounds, and the summary of experience gained from the storage of radioactive compounds at the Radiochemical Centre which is given in the third booklet, *The Stability of Labelled Organic Compounds*, should be very helpful. The information is largely empirical. Data for a number of compounds are listed. The essential factors in the investigation or observation of the decomposition from self-irradiation are the chemical character of the molecule which determines the liability to primary (external) and secondary effects; the purity, the solvents and diluents, the concentration, the specific activity, the temperature and other environmental conditions; and the type and energy of the radiation from the incorporated nuclide. A detailed list of precautions in handling or storing radioactive organic compounds is included.

The fourth and most recent booklet, *Standards of Activity*, discusses the types of standard available, their certification and use. The activity of a quantity of radioactive material is defined in accordance with the 1962 report of the National Commission on Radiological Units and Measurements (ICRU) (*NBS Handbook* 86) as the number of nuclear disintegrations which occur in the quantity in unit time. The curie, $5{\cdot}7 \times 10^{10}$ disintegrations per sec, is the special unit of activity, and activity can be quoted in curies or in its sub-multiples. Activity is not constant with time but decays at a rate determined by the radionuclides present.

Because of uncertainties in purity and half-life, the accuracy to which the activity can be calculated at a given time becomes worse the longer the period from the reference time. Standards of activity have therefore an ephemeral nature and care must be taken in the interpretation of the title 'standard'. The most satisfactory physical form for a standard of activity is a solution in a flame-sealed glass ampoule, but other forms are available. Standards of activity are principally used for the calibration of measuring instruments, and the booklet makes clear the precautions to be taken if full use is to be made of the high accuracy associated with absolutely standardized solutions. In the second half of the booklet the standards available from the Radiochemical Centre are discussed and a complete schedule (operative during 1965–66) of standardized solutions together with details of their guaranteed accuracy and delivery time is given. Each of the four booklets contains a list of references.

S. WEINTROUB

* The Radiochemical Centre. *Selected References to Tracer Techniques*. Revised edition. Pp. 12. *Radioactive Isotope Dilution Analysis*. Second Edition. Pp. 12. *The Stability of Labelled Organic Compounds*. Pp. 14. *Standards of Activity*. By G. R. Newbery *et al*. Pp. 27. (Amersham: The Radiochemical Centre, 1965.)

SCIENCE ABSTRACTS

MEMBERS of the Documentation Research Project section of the American Institute of Physics have carried out a comprehensive survey of published physics literature by a detailed analysis of the contents of the 1961 issues of *Physics Abstracts* (Section *A* of *Science Abstracts*). A report of the survey has recently been published*. A total of 20,287 abstracts covering 405 periodicals from 29 countries were scrutinized, and certain details coded and transfered into machine-readable form. The method of coding used is described and illustrated by a code sheet and sample abstract. The specific codes chosen for the country of origin, the periodical, the language and the subject fields, which formed the four major fields of enquiry, are included in an appendix to the report. Each field is dealt with in detail in a separate section of the report. The greater number of papers were devoted to nuclear physics and solid-state physics. About half the articles abstracted during 1961 had been published during that year. This may be closely related to the fact that *Physics Abstracts* uses the author abstract when available. There were twice as many author abstracts as signed abstracts. Incorporated in the report, in addition to the numerous tables of data and illustrative charts, is a reprint of an article in the *Journal of Chemical Documentation* (4, 157; July 1964), in which a description is given of an investigation of the time-lag of coverage by *Physics Abstracts* with respect to three particular periodicals. The time-lag refers to the time in months between the date of issue of the periodical in which an article appeared and the date of appearance of its abstract in *Physics Abstracts*. The three periodicals were *Physical Review Letters* (an English language journal with no author abstracts), the *Journal of Chemical Physics* (an English language journal with author abstracts for articles but not for Letters to the Editor), and *Zeitschrift für Physik* (a foreign language journal with author abstracts in English or in a foreign language). The investigation showed that the average time-lag was similar for all three periodicals, about three to four months. Many factors contributed

* *The Journal Literature of Physics: a Comprehensive Study based on Physics Abstracts (Science Abstracts, Section A), 1961 Issues*. By Stella Keenan and Pauline Atherton. Pp. 156. (New York: The American Institute of Physics, 1964.)

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to the time-lag, but the analysis indicated that the availability of author or English language abstract could reduce the time-lag by as much as one month.

Science Abstracts, which consists of two sections (Section *A*, *Physics Abstracts*, and Section *B*, *Electrical Engineering Abstracts*), is produced by the Institution of Electrical Engineers, in co-operation with the Institute of Physics and the Physical Society, and the American Institute of Physics. The director is D. S. Hopper, and advisory editor B. M. Crowther, formerly editor. The editor for Section *A* is A. Tybulewicz, assisted by seven assistant editors, and for Section *B*, L. MacQuisten-Wallace, assisted by five assistant editors. During 1964 the original committee of management was replaced by an advisory panel the function of which is to consider the questions of general coverage and production of the *Abstracts* and future automatic retrieval. An important conference of representatives of interested bodies, together with delegations from the United States and from the Science Research Council (then the Department of Scientific and Industrial Research), was held during October 1964. Certain important changes have already taken place in *Science Abstracts*, both in format and in price. The publication in the early weeks of this year of the 1964 author and subject indexes was a welcome surprise. The reduction in time-lag between publication of articles and their abstracts and the increased coverage more than offset the unavoidable greatly increased price. Some years ago, a larger page size and photolithographic reproduction were introduced, but it is only recently that the full advantages of these changes have been utilized. The U.D.C. classification number, which used to be attached to each abstract, was dropped some time ago without any complaints by users, and to follow the development of physics a gradual but continuous revision of subject headings has taken place. Details of the revision and of the arrangements of entries are all carefully explained and listed in the index numbers. A notable change in the form of the author index took place in March 1965. A new style to be used in the monthly index and in cumulative indexes, which enables an entry card on which the details of an abstract is entered to be arranged easily in index order or to be used several times for different author indexes, has been introduced. A shortened form of the title of an article is used. When the article has several authors, each author's entry appears separately and all the names do not appear together in the entry, but the first author's name is followed by the sign '+' before the abstract number and the co-authors' entries with the '+' sign after their name. Commencing with Volume 68 (1965), *Science Abstracts* will publish the annual cumulative indexes in two parts, each covering a six-month period. The first parts covering the January–June issues have already appeared and the Part 2 (July–December) indexes will be issued after the publication of the December issue. Abstracts are numbered consecutively throughout the twelve monthly issues as previously.

Author and subject indexes covering the period 1960–64 for both Sections *A* and *B* are to be published during 1965. The cumulative author index for Section *A*, *Physics Abstracts*, contains some 240,000 entries covering 2,300 pages of text and is bound in four parts. Its publication date was May 1965. The cumulative subject index with about 370,000 entries is to follow, as also the indexes for Section *B*, *Electrical Engineering Abstracts*.

SYNTHESIS OF RIBONUCLEIC ACID BY DIFFERENT REGIONS OF THE EARLY AMPHIBIAN EMBRYO

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The differentiation of the various regions of an embryo into a number of distinct adult cell types must involve the synthesis in each region of a characteristic battery of proteins. According to present ideas, this must necessitate the production in each region of specific messenger RNAs which 'code for' the proteins. It is also necessary that the embryonic cells should provide themselves with the protein-synthesizing machinery, such as ribosomes, with which they are initially not adequately equipped. One should therefore expect that there are well-defined differences in RNA synthesis both in time and space within an embryo. However, even in well-studied forms, such as the vertebrate egg, we are only just beginning to become acquainted with the basic facts.

The technique which was employed first was autoradiography, and it was shown[1] that shortly after gastrulation begins there is a regionally differentiated pattern of RNA (and protein) synthesis, which is most rapid in the organs of the dorsal axis. This synthesis occurs predominantly in the nuclei, and more specifically in the nucleoli, organelles which have long been suspected, and more recently definitely shown[2,3], to be concerned with the production of ribosomes. However, the nature of the RNA detected in the autoradiographs remained a matter of conjecture. Biochemical methods have also shown that there is more rapid RNA synthesis in the dorsal parts of the amphibian embryo[4], and that there are differences in the base compositions of the total RNAs of various regions[5]. The method of centrifugation through a density gradient, which can be used to examine the sedimentation constant of the various RNAs, has been applied by Brown and Littna[6] to material extracted from whole embryos of *Xenopus*. In most of these the RNA had been labelled with phosphorus-32 incorporated into the oocyte, and available by turn-over to syntheses occurring at later stages, but in some experiments $^{14}CO_2$ was supplied directly to embryos. Studies were made on the sedimentation patterns of RNAs extracted from whole embryos at various stages, but no attempt was made to characterize the different regions or tissues.

The main aim of our experiments was to compare the sedimentation patterns of different regions of the embryo at different stages. They therefore had to depend on the dissection of embryos so as to isolate the regions to be studied. This is bound to be a somewhat laborious task, the difficulty increasing with the precision and detail of the dissections. It was therefore first necessary to discover whether sufficient label for the purposes of sedimentation analysis could be got into the RNA of a reasonably small number of embryonic organs, such as would be practicable to dissect. It was also necessary to discover what labels could be taken up by isolated organs; in *Xenopus* substances such as nucleotides are taken up very badly if at all by uninjured embryos[6].

We have worked mainly with newt (*Triturus alpestris*) embryos, although a few experiments have been made with axolotl material. As label we used uridine-5-^{3}H (from Radiochemical Centre, Amersham, England, 24·4 c./mmole). It was found that this penetrates adequately through the cell plasma membranes which are internal to the embryo, but was absorbed very poorly in isolates

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