ABBREVIATED TITLES FOR SEROLOGICAL PRODUCTS

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Increasing emphasis is being placed on the availability of immunization and serotherapy records which should be accurate, brief, legible, and easily understood. While different manufacturers and doctors devise their own capital abbreviations or symbols for proper names or trade names, difficulties often arise if patients change their doctors in any one country, and the trouble is likely to be even worse if they move to another country. These difficulties have already been the subject of comment in the medical press.

As the number of preparations with lengthy titles—for example, some of the varieties of combined prophylactics—is increasing every year, it would be very desirable to agree either nationally, or preferably internationally, on abbreviations for such biological products. It is of considerable importance that the number of such abbreviations should be kept within bounds, and that a doctor should be able to identify correctly the materials mentioned in any records presented to him.

Examples of Confusion

This is far from the case at present, and there is evidence that symbols, both official and unofficial, have in practice given rise to confusion. Examples are as follows:

(a) A.T.T. may mean tetanus antitoxin (A.T.S.) or tetanus toxoid (T.T.).

(b) A.D.S., D.A.T., A.T.D., C.D.A., and R.D.A. have all been used for diphtheria antitoxin. The C in C.D.A. stands for "concentrated" and the R in R.D.A. for "refined."

(c) T.A.B.C. usually indicates typhoid and paratyphoid A, B, and C vaccine, but some doctors use it for T.A.B. plus cholera vaccine. The Ministry of Health in this country issued a directive many years ago that "cholera" was always to be written in full in a vaccine title, but this ruling may not be generally known. T.A.B.T. is the usual abbreviation for T.A.B. vaccine and tetanus toxoid, but this combined prophylactic has sometimes been recorded as T.A.B.T.T. In some countries the final T of T.A.B.T.T. might be thought to imply typhus vaccine.

(d) D.T.P. indicates diphtheria-tetanus-pertussis prophylactic in some parts of the world, whereas in Great Britain it might be interpreted as diphtheria-tetanus prophylactic. This particular confusion is unfortunate, as it is important to know whether a young child has been protected against pertussis. Recently, yet another combination of letters—namely, C.D.T. (combined diphtheria and tetanus toxoids)—has been employed for diphtheria-tetanus prophylactic in Australia. Furthermore, W.D.P. and D.P.P. both stand for diphtheria-pertussis prophylactic in Great Britain.

(e) The French T.A.B.T.D.R. is a mixture of T.A.B. vaccine, tetanus and diphtheria toxoids, and typhus rickettsiae. Probably few people in other countries would identify the product correctly.

These few examples serve, we hope, to illustrate the confusion. Perhaps, as a last word, we may point out that the letter P, which often occurs in the abbreviations in current use, stands from time to time for purified, pertussis, precipitated, phosphate, or prophylactic.

Agreed Abbreviations

Confusion can only be avoided by the agreed adoption of a logical scheme of abbreviations. Such a scheme would require the approval, in any one country, of the controlling authorities, both legislative and pharmacopoeial. Thus, in Britain, official abbreviations would require approval under the Therapeutic Substances Act, and such approval could be endorsed by inclusion of the abbreviated titles in the appropriate monographs of the *British Pharmacopoeia*.

Obviously national agreement could be secured more easily than international agreement, the latter being, equally obviously, the final aim. Consequently, any scheme proposed for national use should as far as possible be designed in such a way—for example, by the abbreviation of Latin rather than English titles—that it can be readily adapted to international needs.

With these considerations in mind the Serological Products Committee of the British Pharmacopoeia Commission has been discussing the whole problem. No final proposals have yet been put forward by the Committee, and the suggested outline that we give below represents our own ideas. Nevertheless, the Committee felt that a useful purpose would be served by asking for comments on these preliminary and tentative proposals before any official action was taken, and has approved the publication of this note.

Outline of Proposed Scheme

The basic scheme which we suggest consists of two parts, each abbreviation comprising (1) a shortened version of the name of the disease or organism associated with the material administered, and (2) a shortened version of the name of the type of product concerned. In some cases a third part may have to be added in order to identify a particular variety of the type of product.

Names of Diseases or Organisms

The first general principle is that, where only one disease or organism is mentioned, three letters (usually the first three) are used. Wherever possible the Latinized title is abbreviated. Should confusion appear likely as a result of this general method of abbreviation, the full name is used. The following is a list exemplifying the system:

Cho = Cholera	Rab = Rabies
Dip = Diphtheria	Sca = Scarlatina
Gas = Gas gangrene (oedematiens + septicum + welchii)	Sta = Staphylococcus
Oed = Gas gangrene (oedematiens)	Tet = Tetanus
Sep = " " (septicum)	Tub = Tuberculosis
Wel = " " (welchii or perfringens)	Typhoid = Typhoid
Lep = Leptospirosis	Typhus = Typhus
Per = Pertussis (whooping-cough)	Var = Variola (smallpox)
Pol = Poliomyelitis	Yel = Yellow-fever

The second general principle is that, where more than one disease appears in the title, capital letters only are used as abbreviations for the names of the diseases and organisms. This is necessary in order to avoid overlong abbreviations, and, in our view, can be accomplished without confusion within the framework of this general scheme. Examples of such combined preparations and their abbreviated titles are given below.

TAB = Typhoid, paratyphoid A, paratyphoid B.
TABC = Typhoid, paratyphoid A, paratyphoid B, and paratyphoid C.
TABT = Typhoid, paratyphoid A, paratyphoid B, and tetanus toxoid.
DTP = Diphtheria, tetanus, and pertussis.

N.B.—Unless the use of a single letter (capital abbreviation) for each disease has been "recognized" for inclusion in the name of a given combined preparation, the first three letters of the disease should be employed, as, for example, in designating typhoid, paratyphoid A and B, and cholera vaccine as TABCho.

Type of Product

The abbreviation of the name of the disease or organism is followed by a diagonal line, after which appears the abbreviation for the type of product. The scheme envisages the use of two principal types of product—namely, prophylactics, for which the general abbreviation Vac is suggested, and therapeutic antisera, for which the general abbreviation Ser is suggested. In a few cases the abbreviation Vac will be

replaced by Tox, where both a vaccine and a toxoid are commonly available. The following examples show how certain well-known products would be abbreviated according to this scheme.

Cho Vac	= Cholera vaccine
Dip Ser	= Diphtheria antitoxin
DP Vac	= Diphtheria-pertussis prophylactic
DTP Vac	= Diphtheria-tetanus-pertussis prophylactic
Sep Ser	= Gas gangrene (septicum) antitoxin
Wel Ser	= " (welchii) "
Gas Ser	= Mixed gas gangrene antitoxin
Sca Vac	= Scarlet fever prophylactic
Var Vac	= Smallpox vaccine
Sta Tox	= Staphylococcus toxoid
TABC Vac	= Typhoid, paratyphoid A, B, and C vaccine
TABCho Vac	= T.A.B. and cholera vaccine
TABT Vac	= T.A.B. vaccine and tetanus toxoid
Tet Ser	= Tetanus antitoxin
Tet Vac	= " toxoid

Varieties of Type of Product

Where there are a number of distinct varieties of one type of product and it is desirable to distinguish between them, the two-part abbreviation just described is followed by another diagonal line, after which is written an approved abbreviation for the particular variety of product concerned. This should not be a frequent problem and is of major importance only in the case of the diphtheria prophylactics. The following examples serve to illustrate how the scheme would work.

Dip Vac FT	= Diphtheria prophylactic formol toxoid
Dip Vac APT	= " " alum precipitated toxoid
Dip Vac/PTAP	= " " purified toxoid aluminium phosphate
Dip Vac TAF	= Diphtheria prophylactic toxoid antitoxin floccules
Tub Vac BCG	= B.C.G. vaccine

It should be noted that it is only in these varieties of product—namely, in the third part of the abbreviation—that departures from the general principles that we have enunciated creep in because of well-established usage. Thus, P is used in Dip/Vac/PTAP both for "purified" and for "phosphate." If, however, each of these third-part abbreviations requires individual approval, no real difficulty should arise.

We should be extremely glad to have comments on these proposals.

We should like to acknowledge our debt to all the members of the Serological Products Committee of the British Pharmacopoeia Commission, and especially to Professor C. L. Oakley, for helpful criticism. We would also like to thank Mr. A. T. Glenny, F.R.S., who has given us detailed comments on many of our suggestions.

RADIATION PROTECTION AND RADIOSENSITIZERS

CAMBRIDGE MEETING OF FACULTY OF RADIOLOGISTS

[FROM A SPECIAL CORRESPONDENT]

Methods of modifying the effects of ionizing radiations on living tissues were until recently of concern only to radiotherapists. But now the increasing use of x rays and radioactive substances in science and industry, the not too distant prospect of the widespread use of atomic sources of power, and the threat of atomic warfare have combined to make the subject of profound interest to the whole population. It was timely, therefore, that the Faculty of Radiologists should discuss this question at their annual meeting at Cambridge, held on June 29 and 30.

Radiation Sickness and the Adaptation Syndrome

Professor Z. M. BACQ, professor of pharmacology at Liège University, opened the discussion by examining the relationship between radiation sickness and the adaptation syndrome. In irradiated animals it was usual, he said, to find changes in the amount of cholesterol and ascorbic acid in the suprarenals. Rats subjected to a dose of 800 r usually showed a marked fall in the cholesterol content over the first one or two hours, with a return to normal in 24 hours. There then occurred a second fall, continuing until the death of the animals on the fifth to ninth days. If the protective

agent cysteamine was injected immediately before irradiation the same drop in the cholesterol occurred at two hours, with recovery in 24 hours, but there was no second drop on the third or fourth days and the animals did not die. The ascorbic acid content followed a similar pattern in the unprotected animal, but again the second delayed fall did not occur if cysteamine had been previously administered. Cysteamine affected the ascorbic acid content of the tissues during the first few hours after its injection, and it was therefore impossible to tell if the early fall following irradiation was modified in any way.

Morphine, Professor Bacq continued, protected against stress by disconnecting the hypothalamic nerve centres from the pituitary gland and preventing exhaustion of the suprarenals. If morphine was given before irradiation the early fall in the cholesterol content of the suprarenals did not occur, but the late effects were not prevented. It seemed, therefore, that the initial suprarenal response was unrelated to the fate of the animal.

Hypophysectomized animals could not be used in this type of investigation. They were extremely sensitive to the effects of irradiation, and they reacted in a very variable fashion. But if after hypophysectomy the hypophysis was grafted into the anterior chamber of the eye the animals reacted to stress differently, there being no nerve connexions to the anterior pituitary. The suprarenal content of both ascorbic acid and cholesterol fell to about half the normal, but after irradiation with 800 r there was no early fall in either substance, and the cholesterol content rose after four or five days. The haematological effects, however, were those of normal animals. In similar experiments with newborn animals the reaction paralleled that in the hypophysectomized and transplanted animal. The protection afforded by cysteamine could not be accounted for by neutralization of the neurohypophyseal reaction, said Professor Bacq. The explanation must lie in the very early stages of the irradiation reaction, as injection of the cysteamine, even ten to twenty seconds after the irradiation, would not protect the animal. The protection it gave was probably due to its oxygen effect or to combination with free radicals.

Protection by Haemopoietic Tissue

Dr. J. F. LOUTIT, director of the Medical Research Council's radiobiological research unit at Harwell, said he had no practical knowledge of protection by means of substances given before irradiation. The work in which he was particularly interested followed on from that of Jacobson and his colleagues. These workers had shown that intraperitoneal transplantation of a normal mouse spleen into the abdomen of an irradiated animal modified the radiation reaction and allowed the mouse to survive from what would otherwise have been a lethal dose of irradiation. They believed that the spleen must contain some humoral agent which allowed this modification to occur. It had since been shown that infant spleen was more effective, and protection could be afforded by any normal haemopoietic tissue, including foetal liver. A dose of 700–800 r was usually fatal in mice, but injections of marrow extract after 1,200 r would convert the normal 100% fatality rate to 100% survival. Bone marrows of unprotected animals showed no active material when examined after death, but animals protected with infantile spleen or bone marrow showed marrow regeneration by the third day after a dose of 1,000 r. By the fifth day the marrow showed the presence of all normal elements, and was more than half full of regenerating elements. There did not appear to be a direct relationship between the amount of the spleen given and the degree of protection, but there was a definite threshold phenomenon. After 950 r whole-body irradiation adequate protection was given by quantities of splenic emulsion varying between the equivalent of four spleens and one-tenth of a spleen. Below the equivalent of one-tenth of a spleen there was much less protection.

The protection afforded by this method could be due either to chemical stimulation of the marrow or to colonization of the irradiated bone marrow by the injected material. In fact it had proved impossible to prepare active extracts of