ON VIRUS NOMENCLATURE

V.B.D. Skerman

Bacteriology Department
University of Queensland, Brisbane, Australia

Dr. C.H. Andrewes (1955) has reported in this Bulletin on the results of a survey of views expressed by a representative group of animal and plant virologists on the question of virus nomenclature. From replies obtained to question (v) "do you favour a Linnaean System (a) as soon as possible, (b) ultimately, but not now, (c) not now, matter to be reviewed periodically, (d) not at all" only eight out of seventy-five of those who answered were in favour of (d).

Approximately 90 per cent of those who expressed their interest in the taxonomy of viruses, had at least a leaning towards the Linnaean System. However, forty-five out of the one hundred and twenty approached did not answer the questionnaire at all. Furthermore, the selection of the one hundred and twenty was made, according to Dr. Andrewes, "as representative as possible both on a geographical basis and on the basis of known or suspected opinions of the people concerned." The selection was not at random. Had it been so, the proportion not answering the questionnaire would probably have been higher.

It is not the author's intention to analyze and criticize the approach adopted by Dr. Andrewes but merely to use the information obtained by his survey to emphasize that the majority of workers, not only in the virus but also in the bacterial field, are not interested in taxonomic matters. Even amongst those who do express their opinions some do so solely in defence of a terminology to which they have become accustomed and without regard to the dictates of internationally accepted rules of nomenclature. It is therefore pertinent to ask what is, in fact, the immediate aim of the virologist? Is it to provide a nomenclature and classification for viruses or is it to ensure that when a certain virus is being discussed the virologists are all referring to the same thing? There is a subtle difference between the two and the latter can be quite simply resolved without resort to the former.

Anyone acquainted with developments in the bacterial field

is only too well aware that rules of nomenclature are not substitutes for sound means for identification. No matter how often the name of a bacterium may be changed, its stable characteristics, and hence the means by which it is identified, remain the same. What little stability has been achieved in the bacterial field has been due, not to mere agreement on a name, but on an agreement on the means of identification. This fact must be equally true in the virus field. Would it not suit the purpose of the virologist if, for the present, as an aid in the attempt to allocate names to viruses, a move was made to draw up a mechanical scheme for their identification? The fact that different viruses are recognized, whether it be on differences in the characteristics of the virus particles themselves or in the pathological conditions they cause, must justify the statement that means exist for their separation. A mechanical scheme could set out exactly those steps which are taken at present to identify each known animal or plant virus or virus disease. This would take the form of a number of keys probably based on the hosts, the latter being referred to by their Linnaean binomials. At the termination of each branch of a key, not one, but all the names applied to a single virus could be placed. The list could include a general interpretation in several common languages. Such a proposal would have the following advantages:

- (i) It would make clear the premises upon which any proposed name is based.
- (ii) It would make clear the several names which have been applied to the one virus and at the same time standardize the several linguistic expressions of the same statement.
- (iii) It would satisfy the requirements of those virologists whose immediate interest is virus identification and not nomenclature.
- (iv) It would serve the immediate requirements of all virologists from a nomenclatural viewpoint and may stimulate a number to take an interest in virus taxonomy by providing a common ground for discussion.

BACTERIOLOGICAL NOMENCLATURE
AND TAXONOMY

- (v) It would render unnecessary any immediate attempt to introduce a universally acceptable system of nomenclature.
- (vi) It would clarify the state of our knowledge of those viruses or virus diseases which at present are too poorly understood to merit even the non-Linnaean binomials recommended at the Rome Congress (1953).

What of the Linnaean System?

Within English speaking countries, Sus scrofa Linnaeus is known as a pig in Australia, a hog in America and a swine elsewhere. It requires no imagination to perceive the chaos arising from the multilingual treatment of even a single virus such as that of swine influenza! Nevertheless, the use of this multiplicity of common names for the one virus is valid in mechanical keys to aid in the resolution of differences in terminology. Something must ultimately be done, however, to arrive at a single internationally acceptable name to replace them. It must also be in an internationally acceptable language. There appears to be no good reason why this should not be Latin.

It has quite justifiably been asserted that we know too little about the phylogenetical relationship of viruses to be embarking on the use of a Linnaean system of nomenclature. Does it necessarily follow that the use of a Latin binomial infers a phylogenetical relationship? Van Niel has pointed out that Cohn, in using the Latin binomial in naming species and genera in bacteria, regarded the latter as form genera. If virologists wish to preserve the scientific dignity of the Linnaean binomial it should be sufficient to suggest--in a mechanical system--a latinized name to replace the multiplicity of common names. Such names could be used in international publications until such time as virologists consider it opportune to replace them with Linnaean binomials.

A proposal of this nature was submitted by the Virus Subcommittee of the International Nomenclature Committee at the 6th International Congress of Microbiology at Rome in September, 1953.

It should, however, be emphasized that resolution of the present differences regarding the use of latinized names for viruses is really a minor matter. The real problem lies in the realm of virus classification, that is, the determination

of biological relationships amongst viruses. This must, of course, be resolved before any generic names can be supplied. Because we have little information on this subject, the majority of virologists are opposed to the introduction of a classification such as that proposed by Holmes. Whilst one must agree with those who hold this view, the author supports the contention of one prominent virologist that something must be done to sort out the mass of information which has accumulated. It is quite possible to do this by the use of the mechanical scheme outlined in preceding paragraphs.

One must add a word, however, in defence of Holmes, In the author's own experience in endeavouring to produce a mechanical system for the generic identification of bacteria (Skerman 1949) of which an expanded edition is being prepared for inclusion in the 7th edition of Bergey's Manual, it is dangerous to attempt to generalize over the whole of the virus field on the basis of experience gained in only a limited aspect of it. Only Holmes and others who have attempted the task can readily appreciate the problems involved in trying to draw up a general virus classification. Irrespective of what views may be held of the Holmes classification, there can be no doubt that it has precipitated a long overdue consideration of the problem.

On the matter of compromise.

From replies received to the first three questions in Andrewes questionnaire, it is apparent that the majority of virologists favour treatment of all viruses along parallel lines and some compromise between diverging views on virus nomenclature.

Taxonomic matters should not be taken too seriously. It is true that there is much to be gained from the study of the biological relationships within the animal and plant kingdoms but it is equally true that our efforts in this direction are limited entirely by the tools of our profession. In the bacterial field, the history of classification is in fact a history of technical development. With changes in technique, we have had added information which has led to changes in our conception of bacterial relationships. What may be regarded now as varieties of a species may possibly, years hence, be so subdivided within themselves as to be raised to generic rank. Dogmatism in taxonomy is therefore pointless. If we

BACTERIOLOGICAL NOMENCLATURE
AND TAXONOMY

are to achieve anything of use to the present generation of scientists, we must treat taxonomic matters in a more philosophical way. The only answer is compromise.

REFERENCES

- Andrewes, C.H. and others. Report of the Subcommittee on viruses. *Int. Bull. Bact. Nomencl. and Tax.* 4:109-114. 1953.
- _____. Report on a questionnaire concerning virus nomenclature. *Int. Bull. Bact. Nomencl. and Tax.* 5:79-81. 1955.
- Van Niel, C.B. The classification and natural relationship of bacteria. *Cold Spring Harbour Symposia on Quantitative Biology* 11:285. 1946.
- Skerman, V.B.D. A mechanical key for the generic identification of bacteria. *Bact. Revs.* 13:175-188. 1949.