is described as having been of inferior quality by Wade, offered absolutely everything to accommodate each participant at the lowest possible cost. The people responsible for the program provided more services than would be considered normal. Every individual received exactly what he paid for. The arrangements were clearly indicated and spelled out in the travel brochure received by the participants. Some people received what they did not pay for, since they left their hotels without checking with the cashier. Because prices were cut to the bone, it was not the U.S. taxpayer who was the "innocent victim" but the people in charge of the travel program.

Wade makes little mention of the scientific implications of this congress. Some leading industries apparently thought its value was great enough to underwrite the financial loss that resulted from insufficient participation.

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Pathologic Evaluation and the Blind Technique

At the Conference on Carcinogenesis Testing in the Development of Drugs, held by the National Academy of Sciences–National Research Council (23 to 25 May 1973), Robert Elashoff suggested that, in carcinogenesis tests, the pathology slides should be sent to the pathologist blind (unidentified). Morris A. Weinberger (Letters, 23 July 1973, p. 219) comments on that suggestion.

While several of Weinberger's comments might be relevant to human pathology, Elashoff's suggestion referred to carcinogenesis testing with animals, and it is only in that context that we discuss Weinberger's letter.

A carcinogenesis test is performed in order to determine if a treated group is associated with a higher incidence of cancer than an untreated control group. The control group must be handled in exactly the same manner as the treated group. By sending unlabeled slides to the pathologist we ensure that the integrity of the control group is maintained during the pathologic evaluation.

Weinberger asserts that histopathologic diagnoses are considerably less influenced by subjective factors (for example, knowledge of the treatment given to each specimen) than by other factors. However, a carcinogenesis test is conducted to investigate carcinogenic properties of the treatment in question and not to determine the biases, no matter how small, of a particular pathologist. The prudent investigator should therefore give serious consideration to the blind technique as a means of avoiding errors associated with the influence of subjective factors.

The blind technique can be incorporated into most methods of evaluation. Weinberger points out that the pathologist often wants to review the control slides to establish a basis or orientation for the examination of the slides from the treated group. One method by which this could be done using the blind technique would be to make up extra control slides, select a portion of them by a random process, review these with full knowledge that they are control slides, and then put them aside; finally, the remaining treated and control slides could be examined in a random order using the blind technique. Thus, the pathologist's orientation would be established, and a reduction in bias would be achieved.

Weinberger implies that good pathology is objective. The good pathologist should therefore consider the blind technique as a simple means of control to help prevent systematic errors from being introduced when labeled slides are examined. He should also appreciate that use of the blind technique is an assurance of the lack of bias in the pathologic diagnosis made in an experiment.

There is nothing in the blind technique to preclude a pathologist's exploring "interesting new research clues," as Weinberger fears. Notes can be made on slides that show interesting or unusual findings. After the slides have been identified, the findings can be associated with the treatments received and the pathologist can explore his interests. By using the blind technique he may even avoid wandering down some blind alleys.

The blind technique does not require that the pathologist be kept ignorant of experimental information. Good pathology, like good statistics, requires that the professional partici-

pate extensively in all phases of the experiment. The only ignorance required when the blind technique is used is ignorance of the specific treatment given to the animal whose tissues are being examined.

Weinberger points out that bias can unconsciously creep into observations when the pathologist concentrates on treatment groups (overreading), and that a blind pathologic examination is a useful means to reduce this bias. We agree.

The real issue raised by Weinberger is whether the blind technique is worth the effort necessary for its proper implementation. We believe that the blind technique helps reduce bias and, in so doing, increases the repeatability of a study, protects those reading the slides from charges of bias, and increases the validity of the results. The blind technique is therefore worth a great deal of effort, but how much is too much? We look forward to elucidation of the conditions where blind techniques are important and where they are not important and to results of studies carried out partially with the blind technique and partially not. Such reports would help us and others make recommendations on protocol design in these large-scale animal studies. We also look forward to the development of any other techniques that reduce bias.

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The Confusion over Bacteriophage ϕX-174

In 1935 Sertic and Boulgakov (*1*) analyzed a large number of *Enterobacteriaceae* phages and classified them into 14 antigenic types. They designated these types with the Roman numerals I through XIV. The lowercase Greek letter ϕ indicated that the phage was virulent for several bacterial species, and Arabic numbers identified the particular isolate. One of these phages, ϕX-174, later became quite prominent in the field of molecular biology as a model virus containing single-stranded DNA, and a wave of papers emerged in the late 1950's (*2*). And that is when the real confusion started, because many workers in the field incorrectly called it "phi ex," instead of "phi ten" as originally proposed by Sertic and Boulgakov (*1*). But to top off the confusion, a recent book (*3*) uses still another erroneous denotation $\phi\chi$174 ("phi chi" 174). The symbols γ (*4*) and $\times$ (*5*) instead of Roman numeral ten have also been used in the past. I wonder how many new designations the ϕX-174 phage may yet acquire, because of the unfortunate original choice of the Roman numeral ten and the carelessness of authors or printers.

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Humidifiers and Energy Conservation

The use of home humidifiers has recently been promoted in advertisements as a means of providing more comfort in houses with the thermostat turned down. I grant the value of humidification for personal health and for prolonging the life of furniture. However, many advertisers erroneously describe the humidifier as an energy-saving device because it allows lower temperatures with comfort.

These advertisers and even some heating engineers appear to overlook latent heat of vaporization. The evaporation of 10 gallons of water a day (modest for the humidification of most houses) requires more than 80,000 British thermal units, or the consumption of about 80 cubic feet of natural gas per day. This is approximately 10 percent of the natural gas needed to heat a modest home in an average winter day. Either the furnace or an auxiliary source must provide this heat, even if humidification is accomplished merely by placing pans of water on radiators.

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