DOCUMENTO ORIGINAL EN MAL ESTADO

body ... potent or causes the agglutinins originally ... disappear completely. The Lattes test is for ...s and is based on the presence or absence of ...ntibodies anti-A and anti-B. Known indicator ...llowed to come in contact with a stain or crust, ...ntibodies that become diffuse, when mixed with ...ologous antigens, will cause agglutination. The ...-elution test and the Howard-Martin cellulose ...st, which is a modification, is like the absorp... in that they are based on the ability of a ...ntigen, if present, to absorb antibody contained ...um. After absorption has taken place over a ... period of time, the sample is washed free of ...ed antibody. The absorbed antigen is heated ... moisture chamber and the bound antibody is allowed to dissociate. Appropriate indicator cells are then added and the preparation is observed microscopically at various intervals for the presence or absence of agglutination.

Comparing those tests mentioned, the absorption-elution test is considered the most sensitive and accurate because it measures the antibody absorbed rather than the antibody not absorbed, as in the inhibition test. In the Lattes test, the antibodies involved are very labile in nature, and aging and exposure to environmental conditions may make the results unreliable. The absorption-elution method can be run on small amounts of stained material. The antigens bound tenaciously to the material are not easily removed or destroyed, and this makes the chance of detection very good as compared to other techniques. Modifications to simplify the technique and reduce time by using ammoniacal solutions for extraction (3) and the addition of vacuum filtration for increased efficiency in washing (1) have reportedly produced good results. A technique to incorporate species identification while testing for ABO grouping has also been introduced (14).

Although typing of blood or tissue by serologic methods is possible, the techniques are not as simple as the determination of blood type and group of a living hospital patient who is a candidate for surgery. The more familiar techniques utilized in blood banks for antigen-antibody detection are no longer applicable for the detection of antigens and antibodies in bloodstains. Postmortem changes introduce numerous artifacts. It has been well established that certain bacteria will produce substances identical with, or very similar to, A, B, and H blood-group substances (10). One specific problem is the acquisition of a B-like antigen by the red cells of A and O persons. This has been postulated to be the action of bacterial enzymes, particularly those found in *Escherichia coli* 096, although it has been found in others. These species of bacteria may be present in those specimens submitted for serologic examination, particularly in postmortem tissue. Other blood-group substances deteriorate rapidly in the postmortem state. The rate of deterioration depends, in large part, on environmental factors such as temperature, humidity, drying, and introduction of foreign material. Type and group are determined more easily in blood than in tissue. When the body is fragmented, it may not be possible to obtain blood for examination. In aircraft lost at sea, bodies or body tissues exposed to water for prolonged periods of time may show hemolysis of blood and tissue cells. The problem is further compounded by the fact that accurate, reliable antemortem records of blood or tissue type are usually not available.

It is absolutely necessary that those specimens referred to the laboratory for testing should be properly collected and preserved. It is important that all specimens be labeled properly to preclude the possibility of an interchange or mixup of specimens. All tissue specimens should be placed in individual plastic bags, labeled, and, as soon as possible, refrigerated. Liquid stains are taken up in a pipet or dropper, placed in a test tube, and refrigerated as soon as possible. The remainder of the stain is allowed to air dry and is then handled as a dry stain. Moist stains should be air dried but not subjected to heat. Air drying prevents increased bacterial contamination, and protection from heat prevents protein denaturation. Since moist samples are subject to bacterial changes, the ideal sample would be dry and preserved by refrigeration. Any stained items should be air dried, placed separately into individual plastic bags, and submitted *in toto* for serologic examination.

C. *Microscopic examination:* Microscopic examination of materials found at the wreckage site may be helpful. While it is not always possible to determine whether a fragment of tissue is of human origin by microscopic examination, it is quite easy to recognize nonmammalian tissues such as those from birds, fish, and reptiles. All species other than mammals have nucleated erythrocytes. Fig. 5 illustrates the nucleated erythrocytes in a fish recovered at an accident site. Fig. 6 is a photomicrograph of a histologic section of a small fragment of material recovered when an aircraft was lost at sea. The absence of nuclei in the erythrocytes in this figure confirms that

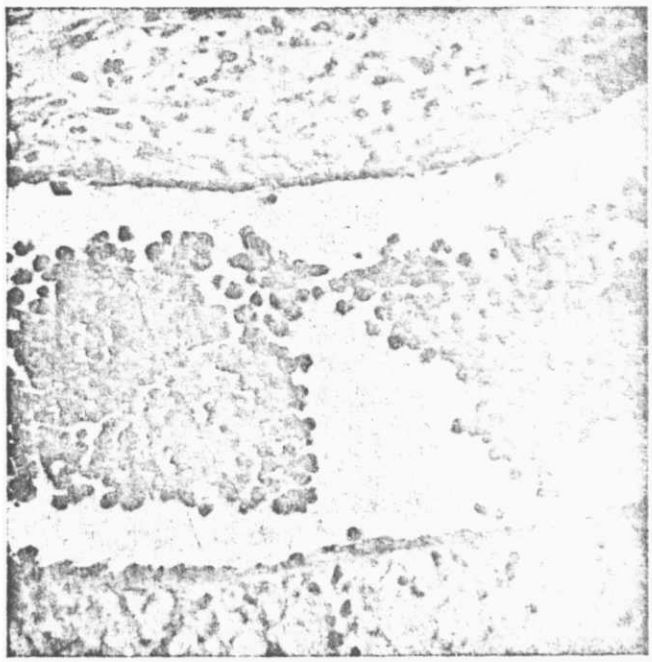

Fig 5. Nucleated erythrocytes (fish). (X440. AFIP Neg. 76-7526.)

Fig. 6. Mammalian non-nucleated erythrocytes. (X440; AFIP Neg. 76-7528.)

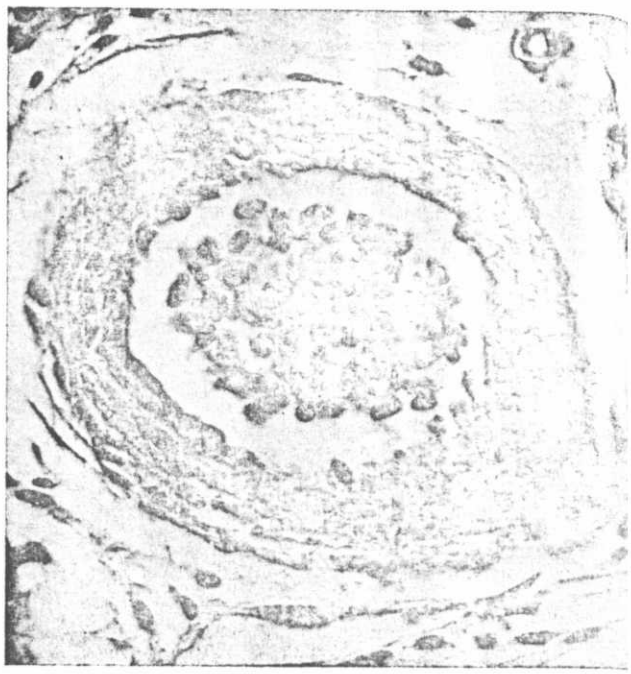

Fig. 7. Nucleated erythrocytes (bird). (X440; AFIP Neg 76-7525.)

the material is of mammalian origin but does not prove that it is of human origin. The possibility that the fragments recovered were from porpoise, whale, or other sea mammal cannot be eliminated by this examination. A common problem the investigator faces is in identification of avian tissue, as in the bird-strike case illustrated by the photomicrograph, Fig. 7.

It is not usually possible to determine the specific identity of a person by histologic examination, but useful confirmatory information may be obtained, as illustrated in Fig. 8. An aviator sustained a severe head injury during ejection from his aircraft. The fragment of sinus mucosa was found on the tail surface of the aircraft. The histologic diagnosis of chronic sinusitis corresponded to the medical history in his records.

D. *Chemical analysis*: Chemical analyses have not been widely applied to examination of small tissue fragments to determine whether they are of human origin. The use of urea nitrogen/uric acid ratios for this purpose has been reported (12). Toxicologic examination may also reveal traces of medications that can be correlated with the person's medical records to confirm identification.

The purpose of this paper was to present problems of identifying tissue found at an accident site. Careful examination of suspected fragments of tissue found at a wreckage site may yield information of value in determining the cause of the accident and in identifying the victims. After initial gross examination, which should include that of the odor, consistency, and general gross appearance, the material should be frozen for transport to the laboratory. Techniques for histologic, serologic, and chemical examinations may be used. Although these are not difficult, they are not routinely performed in most local laboratories.

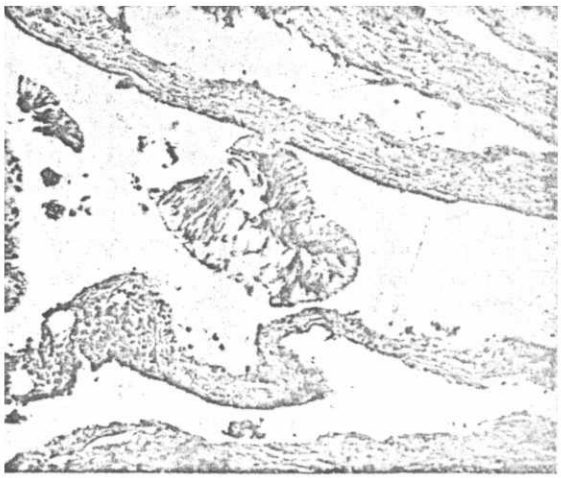

Fig 8. Sinus mucosa recovered from tail surface of aircraft (X100, AFIP Neg. 58-13681 )

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