Hemagglutination determinations of the lung suspensions also demonstrated a difference between the treated and control animals. However, this method of assay which is known to be less sensitive than the *in ovo* titration, revealed less striking differences between experimental and control groups.

Discussion and conclusions. If virus proliferation is partially dependent upon the host's protein synthetic mechanisms, an increase in the rate of protein anabolism in the host may be reflected in an increased rate of virus growth. Under the conditions of these experiments, the data obtained are not inconsistent with this hypothesis.

Summary. When the rate of protein anabolism in the host was increased by testosterone or growth hormone, increases in rate of proliferation and amount of influenza virus were clearly demonstrated.

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A Rapid Method for Detection of Influenza Virus During Epidemics.* (17991)

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The established procedures for the detection of influenza in a community are: (a) isolation of the virus, (b) serological examination of acute and convalescent phase serum specimens, and (c) the inoculation of susceptible animals with throat washings. Regardless of the method, these procedures require several days as a minimum before identification of the agent may be made. During the current epidemic, a screening method has been employed which enables the laboratory to ascertain the causative agent in one day.

Materials and methods. Twenty-eight throat washings were obtained during the epidemic from patients in the student infirmary. These patients were admitted with the clinical diagnosis of either influenza or respiratory infection. Usually the throat washing was obtained during the first 3 days of illness. The patients first coughed several times and then gargled with approximately 15 ml of nutrient broth. These throat washings were then quickly frozen and stored at —70°C until tested. Control throat washings were obtained from 10 persons who gave no history of illness during the previous 3 week period. The throat washings from patients and controls were treated in an identical manner.

The throat washings were thawed under running water and 10 ml removed. The remaining 5 ml was used for isolation of virus by amniotic inoculation of 13-day-old chick embryos. Sufficient 1% red blood cells (either chicken or human type O) in buffered saline were added to each throat washing in order to compensate for the hemolysis which sometimes occurred. This was usually in the order of 2-4 ml. After standing at room temperature for 1¼ hours, the material was centrifuged and the supernatant fluids discarded. To the red cell sediment was added 0.8 ml saline, the mixture shaken and incubated in a 37°C water bath for 2-4 hours with occasional shaking. Following this period of elution, the material was again centrifuged and the supernatant fluids removed to small tubes. Then 0.6 ml of each supernatant was removed and 0.2 ml placed in each of 3 tubes. To the first tube, 0.2 ml 1% fresh erythrocytes were added, to each of the other 0.2 ml samples, 0.2 ml red cells (1%) in a 1:50 dilution of specific antiserum was added. The antisera employed were PR 8, Lee and FM-1. The FM-1 antiserum was

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TABLE I.
The Determination of Influenza Virus in Throat Washings by Absorption and Elution from Red Blood Cells.

No. of throat washings	Positive agg. after absorption	Positive agg. after elution	Specific neutralization		
			PR 8	Lee	FM-1
28	12	8*	0	0	5
Controls					
10	1	0	0	0	0

* Three of these preparations were not inhibited by any of the antisera.

obtained through the courtesy of Dr. Irving Gordon, Division of Laboratories and Research, Albany, N. Y. These hemagglutination tests were read after 30 minutes and 1¼ hours in the usual manner. Care must be exerted in the reading of the tests as the amount of virus present is small. The results are more in the order of a weak positive, the complete agglutination seen with allantoic fluids containing virus is rare. Readings after 30 minutes are helpful inasmuch as there is a difference in the rate of settling of the cells. A few preliminary experiments with 0.5% red cell suspensions indicate a sharper end point.

Results. As seen in Table I, positive identification of the causative agent was obtained in 5 throat washings of the 28 tested. No positive agglutinations were obtained with the control throat washings. Although isolation of influenza virus was not attempted with all 28 specimens, the virus was isolated and identified as a strain resembling FM-1. Isolation of virus was obtained from 3 of the preparations which showed specific neutralization, the other 2 were not tested. From 2 throat washings which did not react to this method, virus was also isolated. From one preparation in which hemagglutination occurred after elution no virus was isolated. No attempts were made to isolate virus from the control preparations.

With some throat washings, 0.5 ml saline was used for elution. In these cases, insufficient material was available for specific identification. Therefore, a multi-valent antiserum (from patients with high titers to the three strains of virus) was employed. Agglutination inhibition was obtained in some of these preparations. The results of complement-fixation tests with sera from these patients indicated the presence of an influenza virus closely related to FM-1.

Discussion. This procedure appears to be of value as a screening method during epidemics of influenza. When large numbers of throat washings are available, random samples may be screened by this procedure in order to identify the strain of influenza virus present in the community. Confirmation using established procedures can then be made. The results obtained by this rapid method were confirmed by established procedures and no false positives were obtained from control material. It is obvious that this procedure is only valuable when a large number of specimens are available. A certain number of specimens containing small amounts of virus will yield negative results by this method and positive results by the standard methods.

It is possible that a modification of the technic may be of value in increasing the concentration of influenza virus in order to enhance isolation procedures. It may also be possible to utilize this method for the isolation of other viruses such as mumps.

Non specific positives are obtained in certain specimens which may be due to the activity of saliva(1) or other agglutinating agents.

Summary. A rapid method for the detection of influenza virus in throat washings during epidemics is described and discussed. Essentially this method consists of concentrating and eluting the virus by red cell adsorption and then neutralizing with specific antisera.

1. Francis, T., Jr., and Minuse, E., PROC. SOC. EXP. BIOL. AND MED., 1948, v69, 291.

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