inhibition and growth retardation (NAEYE and BLANC: J. amer. med. Ass. *194:* 1277 [1965]). In seeking an explanation for these phenomena a substance inhibiting mitosis was found in infected WI-38 cells. WI-38 cells that had gone into mitotic arrest two weeks after rubella virus infection were extracted by freeze-thawing. When freed of virus, extracts of infected cells induced mitotic inhibition of normal WI-38 cells and of a skin fibroblast cell strain. No effect was seen on continuous lines of human cells or on non-human cell lines. The inhibitory substance was trypsin-sensitive and heat-labile but was unaffected by rubella antibody, ether, ribonuclease, or deoxyribonuclease. It was not sedimentable or acid-stable and did not protect cells against the action of vesicular stomatitis virus. Concentrated rubella virus inactivated by ultra-violet irradiation did not itself produce growth inhibition.

This substance offers a potential explanation for the mitotic inhibition associated with rubella virus infection *in vitro* and *in vivo*. (SPR)

34 *Clinical Experience with Natural and Atentuated Rubella Virus Infection.* H.M. MEYER, Jr.*, P.D. PARKMAN* and T.C. PANOS, National Institutes of Health, Bethesda, Md., and Univ. of Arkansas Medical Center, Little Rock, Ark.

Experience with attenuated rubella virus (strain HPV-77) indicates that infections in vaccinees are asymptomatic and non-communicable. HPV-77 is fully immunogenic when given parenterally but much less so intranasally. Ninety-six % of 51 subjects given 10 to 10,000 tissue culture infectious $dose_{50}$ ($TCID_{50}$) subcutaneously developed antibodies while only 2 of 26 sero-converted after intranasal inoculation. None of 49 susceptible contacts of vaccines was infected. Antibodies evoked by HPV-77 remained unchanged in titer in 30 persons followed for 1 year. In a group with natural rubella, antibodies also followed a plateau-curve but were 8 to 16 times higher throughout. Vaccine dosage did not influence antibody response; inoculation of 10, 100, 1000 or 10,000 $TCID_{50}$ of attenuated virus resulted in similar levels of antibodies. Persons with prior immunity from natural rubella had antibody increases in 2 of 17 instances after rubella exposure and in 3 of 12 after HPV-77 vaccination; none had illness or excreted virus. Five children with antibodies from vaccination 8 to 12 months earlier were challenged intranasally with 200 $TCID_{50}$ of unmodified virus. All remained asymptomatic and virus was not recovered from pharyngeal swabs or blood. Antibody levels increased in two. Five controls similarly challenged developed typical rubella with virus excretion and viremia. These observations suggest: 1. the HPV-77 strain is a safe and effective immunizing agent; 2. vaccine-induced immunity persists for long periods; 3. under natural conditions rubella exposure may be important in insuring life-long immunity; 4. attenuated virus vaccine can boost antibody levels of persons with declining immunity. (APS)

35 *Evaluation of a Live Attenuated Mumps Vaccine.* PHILIP A. BRUNELL* and ANTHONY BRICKMAN*, NYU Sch. of Med., New York, N.Y. (introduced by Saul Krugman).

A live attenuated mumps vaccine (Jeryl-Lynn strain) was evaluated in a field trial which included more than 2300 children who had no previous history of mumps. The objectives were to study antigenic potency and side effects of the vaccine. Parents of vaccinees recorded daily temperatures and other symptoms on a card which was returned. Paired serum specimens were obtained at the time of vaccination and one month later from 1202 children. The results to date indicate: 1. 45 % of 592 children who had no history of having mumps had detectable serum antibody before vaccination; 2. 98 % of 340 seronegative vaccinees had 4-fold or greater antibody response; 3. the vaccination was tolerated very well; the incidence of febrile responses and of clinical symptoms was essentially the same in 335 successfully vaccinated children as compared with 252 children who were immune prior to vaccination. These studies indicate that the vaccine is antigenically potent and is clinically acceptable. (SPR)

36 *Experimental Genital Herpes Simplex infection in the Mouse.* ANDRÉ J. NAHMIAS, ZUHER M. NAIB*, ANITA K. HIGHSMITH* and WILLIAM E. JOSEY*. Emory Univ. Sch. of Med., Atlanta, Ga.

In view of the important role of maternal genital infection as the source of herpes simplex virus (HSV) infection in the newborn (J. amer. med. Ass. *199:* 1132 [1967]), an experimental model in mice was developed. Female mice could be readily infected by insertion in the vagina of a cotton pellet soaked with HSV. The occurrence of infection was substantiated by the recovery of virus from the vagina for as long as 12 days and by the demonstration of concomittant cytological changes (multinucleated giant cells with intranuclear inclusions). 90 % of the mice died of encephalitis within 20 days after inoculation. Death could be prevented in up to 60 % of infected mice by repeated administration of gamma globulin.

Evidence has been obtained that the newborn mouse becomes infected with herpes simplex virus on passage through the infected birth canal of the mother mouse. Infection in male mice was also induced by direct inoculation of virus in the penis. In addition, sexual transmission of genital infection was demonstrated when uninfected male mice placed in contact with infected females developed herpetic penile lesions.

Using this experimental model, it has also been possible to differentiate herpes strains obtained from human genital lesions from strains recovered from non-genital sites. Such differences between genital and non-genital strains of herpes simplex virus have also been found by immunological methods and by inoculation onto chorioallantoic membranes (genital strains form large pocks, non-genital strains form smaller pocks). (SPR)

37 *Studies on the Virulence of Herpes Simplex Viruses Isolated from Different Clinical Entities.* CHARLES ALFORD*, MARTHA SNIDER* and GAYLE STUBBS*. U. of Alabama Medical Center, Birmingham, Ala. (introduced by Herschel Bentley).

Recently, herpes simplex viruses (h.s. No. 1) were isolated at 5 days and 6 months after delivery from an infant with recurrent skin vesicles and microcephaly. Because of the unusual nature of this illness, studies on the virulence of h.s. No. 1 and 4 other strains of h.s. viruses, isolated from cases of recurrent labialis or conjunctivitis, were performed and compared in mice and in plasma clot cultures of human fetal brain. The virus preparations used were produced and quantitated in primary rabbit kidney cell cultures (RK) and, to avoid laboratory attenuation, 2nd to 3rd passage materials were employed as inocula.