Meetings

Measles Virus and Subacute Sclerosing Panencephalitis

What is the etiological role of the measles virus in the relatively rare disease subacute sclerosing panencephalitis (SSPE) (with an estimated morbidity of 1 : 1,000,000) and in which way is this disease related to the much more frequent measles encephalitis? Assuming a common etiology of these two encephalitides, which factors account for their different clinical, serological, and pathomorphological characteristics? What are the factors which have thus far prevented the transmission of SSPE to laboratory animals and precluded the isolation of the measles virus from the brain of patients with SSPE? These were but a few questions discussed at the conference on measles virus and subacute sclerosing panencephalitis, held in Bethesda, Maryland, 13 September 1967 and attended by about 50 participants.

The purpose of the conference was: (i) To accumulate evidence on the correlation of measles and SSPE; (ii) to consider the need for additional studies which would provide data on which a scientifically sound analysis can be made of the role of measles in SSPE; and (iii) to outline the possible importance of the present findings in relation to other diseases of the central nervous system.

SSPE is known under various synonyms of which subacute inclusion body encephalitis is the most common in this country. The disease was originally described by Dawson, by Pette and Doring, and by Van Bogaert whose names are often eponymically linked with it. As pointed out by Zeman (Indianapolis), a virus etiology was suspected as long as 34 years ago; the herpes simplex virus, vaccinia virus, hepatitis virus, and attenuated poliomyelitis virus, among others, have been incriminated at one time or another as the causative agent.

Beginning in late 1965, evidence has accumulated that the characteristic intranuclear inclusion bodies of the Cowdry type A consist of microtubules, similar to those seen in tissue cultures infected with measles virus, and that these inclusions can be stained with fluorescein-labeled measles antibody. The pathomorphology as revealed by the light and the electron microscope was described by Herndon and Rubinstein (Palo Alto) and by Zu Rhein (Madison). These authors could follow the intranuclear formation of microtubules, their expulsion into the cytoplasm, and finally the assemblage of the virus by an enveloping membrane, possibly derived from the cellular plasmalemma. Adels, Gibbs, and Gajdusek (Bethesda) found enormously elevated complement-fixing, hemagglutination inhibition, and fluorescent antibody titers in the serums of 40 patients with the disease, from both the United States and Europe. These anibodies were also elevated in the spinal fluid, but to a lesser degree. Sever (Bethesda) could demonstrate a sustained high antibody titer during a period of several months, suggesting a chronic infection with continued production of antibodies. The observations of Cutler (Boston) provided convincing evidence that immunoglobulins, in particular IgG, presumably containing measles antibodies, are formed within the brain tissue, probably by infiltrating mononuclear cells.

Several papers dealt with the immunopathologic aspects of SSPE. The pertinent observations were summarized by Kolar (Indianapolis) who found thymic hyperplasia, glomerulonephritis, and iridocyclitis in a large number of his patients with SSPE. Paterson (Chicago) showed how simple immunological procedures can answer some of the important pathogenetic questions relating to the participation of immunopathologic processes in producing the clinical and the pathomorphologic pattern of SSPE. Alvord (Seattle) gave support to the autoantibody hypothesis by demonstrating such antibodies in cases of canine distemper encephalitis.

The specificity of the fluorescent antibody staining of the nuclear inclusions was discussed by Connolly (Belfast) and by Lennette (San Francisco). Both felt that the presence of other myxoviruses is conclusively excluded by the results obtained with this technique.

Adams (Los Angeles) reviewed the relation between measles, SSPE, and multiple sclerosis and suggested that the latter condition is also related to a measles infection. These conclusions were supported by Pette (Hamburg).

Although the agenda left little room for clinical observations, some interesting aspects came to light during the conference. Of particular relevance were electroencephalogram studies reported by Lombroso (Boston) and by Petré-Quaders, Sfaello, Van Bogaert, and Moya (Antwerp). Both groups found evidence that the characteristic high-voltage slow-wave complexes are generated in the brain stem and that they can be manipulated to some extent by neuropharmacologic agents.

The reports on transmission attempts and on efforts to grow the virus in culture left the participants with a feeling of uneasiness. In several attempts, only once has an encephalitis been produced with the inoculation of a brain homogenate into the brain of a macaque. Périer (Brussels) reported on this observation made in 1957, which has remained a singularity. Neither virological studies nor electron microscopic examinations could be performed in this case. However, the author could demonstrate a pathomorphologic syndrome in the brain of the injected monkeys which was similar to that seen in SSPE, including the presence of type A inclusion bodies. Inoculation of the infected monkey brain into the brain of mice, again resulted in an encephalitis, which could then no longer be transmitted. Tourtellotte (Ann Arbor) and Griffith (Boston) suggested that the difficulties in transmitting the disease to animals or growing it in tissue culture may be due to the presence of neutralizing antibodies in the brain tissue. Other possibilities which were discussed are a low concentration of the virus, defectiveness, or the presence of predominantly abortive or of incomplete virus. Any one of these possibilities could also account for the fact that Adels, Gibbs, and Gajdusek (Bethesda) have not observed a rise in the serum measles antibodies in any of the numerous animals injected with brain, serum, and spinal fluids from patients with SSPE.

The proceedings of the conference were critically analyzed by Dick (London) and by Gard (Stockholm), in the form of summarizing statements. The conference was sponsored by the National Institute of Neurological Diseases and Blindness. The complete texts of the papers and the discussions will be published as a supplement to *Neurology* scheduled to appear in the beginning of 1968.

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Soil Geomorphology Field Conference: North Carolina

The Soil Science Society of America, in cooperation with the Soil Conservation Service of the U.S. Department of Agriculture and North Carolina State University, sponsored a 2-day field conference 4–5 November 1967, in the vicinity of Benson and Wilson, North Carolina, to observe geomorphic-soil interrelationships on the upper and middle Coastal Plain surfaces.

The field conference was designed to demonstrate relationships between geomorphic surfaces and soils as revealed by 8 years of field work begun in January 1960 in a cooperative project of the Soil Investigations Division of the Soil Conservation Service and the Soil Science Department of North Carolina State University, with additional support of National Science Foundation. Raymond B. Daniels (Soil Conservation Service), who has been in charge of the project since its inception, was the field conference leader.

Approximately 70 soil scientists, geologists, and physical geographers (55 of them from the District of Columbia and 12 states other than North Carolina) attended the conference, which was scheduled in conjunction with the annual meetings of the Soil Science Society of America the following week in Washington, D.C.

The detailed study divided the Coastal Plain into three subdivisions: the upper, middle, and lower areas, based on stratigraphic and geomorphic relations. In the study area the upper Coastal Plain was found to occur above the Coats scarp with a toe altitude of 275 feet; the middle area, between the Coats scarp and the Surry scarp, toe altitude 94 feet; and the lower area, between the Surry scarp and sea level.

Major changes in geomorphology, stratigraphy, and soils corresponded with the upper, middle, and lower subdivisions. Well- and moderately well-drained soils in medium and fine-textured sediments on the upper and middle Coastal Plain surfaces were found to be paleudults, whose generalized eastern boundary was the Surry scarp. The presence of plinthite characterized the soil profiles of the upper Coastal Plain; fragipans, the middle Coastal Plain.

Information obtained in this study will help explain the soil-geomorphic relationships elsewhere on the Coastal Plain in North Carolina and in the other Coastal Plain states. It is proving invaluable in establishing the new soil classification system on the Coastal Plain, in improving the accuracy and speed of mapping Coastal Plain soils, and in furnishing background information for research on fertilization and for managing the soils.

The North Carolina field conference was held in response to a request by a Soil Science Society of America soil-geomorphology committee for a field conference where graduate students and young scientists in the fields of geology, soil science, and geography could participate with their more experienced colleagues. It also aimed to foster an interdisciplinary approach among geology, soil science, and geography. Last, but certainly not least, the committee had requested the field conference be held in North Carolina to observe how an integrated use of soil morphology and geomorphology was used to determine and understand soil-landscape relationships.

In terms of planning and direction, the well-written 50-page guide book and road log, and the number of interested participants, it was an eminently successful conference.

The committee is considering the holding of a second field conference in the midwest in the fall of 1969. Should such a conference be held, sponsorship by the Geological Society of America and the Association of American Geographers in addition to the Soil Science Society of America, would be essential. Such an arrangement is more apt to accomplish the goal of the committee—the improvement of interdisciplinary relations.

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