SCIENCE NEWS

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SYMPOSIUM ON STAPHYLOCOCCI

WHEN members of the Society of American Bacteriologists gathered, on August 30, for a scheduled symposium on staphylococci at San Francisco they were really sitting down to a council of war.

The enemy under discussion consists of tiny, round germs, the staphylococci, which appear under the microscope in bunches like grapes. These bunch-of-grapes-like germs have been known for a long time as the villains that cause boils, carbuncles and similar afflictions and more recently have been identified as the cause of food poisoning outbreaks. The reason for the war council, however, is that besides causing these relatively minor if distressing conditions, staphylococci are death-dealers when they get into the blood stream.

Recent staphylococci disasters and the renaissance of chemical warfare against germ diseases since the discovery of Prontosil and sulfanilamide have turned the attention of bacteriologists back to these common germs that for many years were relegated to the background in the fight against disease.

Staphylococcemia, the scientific name for blood stream infection with staphylococci, appears to be almost one hundred per cent. fatal. That is why doctors warn laymen against picking or pressing or otherwise meddling with boils, pimples and carbuncles. The localization of the germs in the boil is the best mechanism known for keeping the germs out of the blood stream. Picking or squeezing the boil to open it is like throwing a bomb at your own fortifications. What to do if the germs do get into the blood stream is a moot question. English and Australian physicians believe that a specific staphylococcus antitoxin will cure the infection. American physicians in general do not agree.

Staphylococci do not all produce a toxin or poison. The poison that some of them produce is a more potent killer than the toxins of either the diphtheria germ or the tetanus (lockjaw) germ. An antitoxin can be made which will eliminate or neutralize the staphylococcus toxin in an infected animal, but the animal may die anyway. The death in such case is put down to the "invasiveness" of the germ.

When a boil or carbuncle forms and the staphylococcus infection is localized, the germs are destroyed by the body's large germ-eating cells, the phagocytes. Another mechanism the body has for resisting germ infection consists in the formation of antibodies, invisible substances that combine with the germ's antigen and prevent the latter from causing disease. Some authorities believe that this mechanism is helpless in the case of invasion of the body by mature staphylococci because after a certain stage in their development these germs acquire a hard protective capsule around them. The capsule, like that of the pneumonia germ, may keep the antibody from getting at the germ's antigen.

SYMPOSIA AT THE COLD SPRING HARBOR BIOLOGICAL LABORATORY

SOCIOLOGY as a human science seems to interest its students mainly in places where life is hard—slums, tenant farms, mining and mill towns and the like. Similarly, the study of sociological condition among plants has attracted most attention in places where life for plants is hard—sand dunes, dry plains, mountain slopes, steppes and tundras. This curious parallelism between the two studies was developed in a discussion by Professor H. S. Conard, of Grinnell College, who opened a symposium at the Cold Spring Harbor Biological Laboratory on August 29. Only in a relatively few places have the sociological relationships in really stable plant communities, like those of Switzerland, received close attention. Elsewhere, and especially in America, the eyes of botanists have been attracted by stress and flux and change. Plant societies, as Professor Conard outlined them, may be exceedingly simple and primitive affairs, like the one-layered communities of lichens that cling precariously to the bare faces of rocks. Or they may be highly complex affairs, with many species arranged in a whole series of strata. The contrast is as great as that between an Eskimo village and New York City.

ANIMALS living in a close community or society are not merely individuals in themselves; they are also functioning parts of a super-individual or super-organism. This view was developed by Professor Alfred E. Emerson, of the University of Chicago, speaking at a symposium on ecology. Professor Emerson drew his illustrations principally from the organization of colonies of the social insects, such as ants and termites. Queen insects and their mates, which are the only members of the group able to produce a new generation, he likened to the reproductive organs of the animal body. The worker castes among the insects are comparable to the muscles, bones, and other general body tissues. Among the social insects, secretions produced by one individual or caste and fed to others produce changes in behavior. Similarly, in the animal body, there are the hormones or secretions produced by the ductless glands, which have effects on tissues often quite remote from the cells that produce them. Again, nerve impulses in the body have their analogue in the mysterious calls to action that can spread in a second from one end to the other of a beehive or anthill. Periods of low vitality and recovery in the individual have their parallel in the partial die-off and the renewal of the population within a colony, that come either seasonally or at less regular intervals. Just as a man may say he feels young again (and to a certain extent actually be rejuvenated), so may a colony of the social insects undergo a community rejuvenation.

THE EFFECTIVENESS OF LOW VELOCITY ELECTRON BEAMS IN KILLING FUNGUS SPORES

IT takes more than one electron from a stream of low velocity cathode rays to kill certain types of spores, according to a study by Dr. Caryl P. Hastings from the Massachusetts Institute of Technology reported in *The Journal of Applied Physics.*

It took specially devised apparatus, different from cathode ray tubes in general use, to find this out. Insignificant as this fact may appear on the surface, future work with his pioneering equipment and experiments may lead to important clues as to the nature and treatment of cancerous tissue.

Electrons emitted under a minimum electrical pressure of two kilovolts are necessary to achieve material effectiveness in killing fungus spores studied. Increase of the voltage and the electron dosage produced such marked effects as to indicate that the absorption of more than one electron was necessary for cell death.

The importance of the observations lies in the fact that the killing action of x-rays on cancerous and other tissues has been ascribed not to the x-rays themselves, but to the electrons within the cells which the x-rays hit and cause to bombard vital cell material. Dr. Haskins's study is one of the first making use of low-velocity electron beams to bombard living material, thus making possible quantitative determination of what takes place. Most previous work has been with high-velocity cathode rays and with x-rays.

THE NEW FLUORESCENT LAMP

THE new fluorescent lamp, candidate for the place as successor to the incandescent electric bulb, because of its promise of more and better light for less money, was discussed at the meeting of the Society of Illuminating Engineers at Minneapolis on August 30.

The new lamp works best near room temperatures and gives off much less light at abnormally high or freezing temperatures. If handled properly, it has a longer and more efficient life than the ordinary filament bulb. It gives off but one fourth as much heat as the present type of lamp and therefore is useful in connection with air-conditioned locations.

Speaking before the society, Dr. G. E. Inman, of the General Electric Company, stated that the new lamps provide better daylight illumination than the standard type of bulb, even though certain light in the red end of the spectrum is not radiated by the phosphorus used to generate the light. But the eye, less sensitive to reds than to other colors, does not notice the absence.

The new lamps require a special starting switch to set them going. They use mercury vapor through which an electric current is discharged to generate ultra-violet light which is absorbed by the fluorescent powders coating the walls of the tubular bulbs. This ultra-violet light is re-radiated as light of different colors, depending upon the particular fluorescent material with which the wall is coated.

Extreme variation in the lamp's efficiency at different temperatures was explained by J. W. Marden, N. C. Beese and G. Meister, of the Westinghouse Electric and Manufacturing Company, as being due to changes in the generation of ultra-violet light of a certain wave-length at different temperatures.

FURTHER PAPERS READ BEFORE THE BRITISH ASSOCIATION

AT the Cambridge meeting of the British Association for the Advancement of Science, in a communication presented on behalf of Dr. Robert Broom, of the Transvaal Museum, the fossil skull of a creature that might be the missing link between man and the common ancestor of apes and man, except for its geological youth, was described. The skull is that of a unique anthropoid ape found in South Africa. It is the newest member of the strange family of anthropoid apes, previous forms of which were discovered by Dr. Broom and by Professor Raymond Dart, of Witwatersrand University. These animals existed in relatively recent geologic times, contemporaneously with genuine human beings of Pleistocene or Ice Age time. Sir Arthur Keith stated that "These discoveries have destroyed the fingerposts on which anthropologists have always depended to indicate the line between anthropoid and man." Dr. Broom's latest-found skull, though distinctly anthropoid, has teeth that are human in structure and arrangement. On this point, Sir Arthur Keith remarked, "It is likely that these apes evolved more closely than the gorilla and the chimpanzee from the spot which gave rise to human beings." Whether our present, acquired human gait was used also by these ancient anthropoids, walking as bipeds on South Africa's treeless plains during the Pleistocene, can not be decided until their lower limb bones are discovered.

A NEW method of inactivating plant disease viruses by both x-rays and ultra-violet radiation was reported on jointly by Drs. N. W. Pirie, of Cambridge University, and F. C. Wawden, of the Rothamsted Experiment Station. Their discovery points the way to a possible future method of vaccinating plants against diseases such as mosaic, curly-top and "frenching." It also indicates a way in which safer smallpox vaccine may be prepared. Irradiation enlarges the crystals that may be obtained from the viruses, and reduces their infectivity. Research is now being planned on foot and mouth disease of cattle, now one of Europe's most serious agricultural problems.

RACIAL DIFFERENCES

SUMMING up the lessons of a lifetime as America's pioneer anthropologist or student of man, Professor Franz Boas, in a communication to *The Nation*, denounces racial prejudice abroad and in its "almost equally potent" form in the United States.

Making a stirring plea for freedom from the "shackles of dogma," Dr. Boas, Columbia University emeritus professor, asks that all men apply to all mankind the same treatment and ethical standards that they apply to members of their own particular group of people.

"It is my fundamental conviction," he says, borrowing from his field, anthropology, the term "in-group" which applies to a clan or tribe or group of related people, "that the fundamental ethical point of view is that of the in-group, which must be expanded to include all humanity."

One of his few public utterances since his retirement from active teaching two years ago, Professor Boas sets his opinions down under the title, "An Anthropologist's Credo," one of a series of articles on "living philosophies" which *The Nation* is publishing.

"The identification of an individual with a class be-

cause of his bodily appearance, language or manners has always seemed to me a survival of barbaric, or rather of primitive habits of mind.'' Professor Boas is the author of ''The Mind of Primitive Man,'' one of the classic books in the science of anthropology.

Discussing claims of superiority made by groups such as the Nazis in Germany, he declares: ''It is pertinent to ask whether any group has a rational basis for a claim to rights not accorded to others. The hysterical claims of the Aryan enthusiasts have never had any scientific background. The belief that a necessary relation exists between the racial position of an individual and his mental attitude has never been proved. . . . We may fairly say that if we were to select the best third of mankind, according to intellect and personality, every one of the large races would be represented in that group.''

Primarily an explanation of how one of America's most famous scientists, who was German-born and German-educated, but is an American by choice, arrived at his present outlook, the article nevertheless contains stinging comments on a number of current topics. ''The crudest form of racial consciousness is at present confined to Germany—although with respect to stronger divergences, such as those between Negroes or Asiatics and whites, it is almost equally potent in the United States and in England, mitigated by a hypocritical desire to avoid legal recognition of the facts.''

Freedom from the ''shackles of dogma'' is essential to proper scientific understanding and accomplishments, he indicates repeatedly.

QUESTIONS IN CHILD HEALTH CARE AND EDUCATION

SUGGESTING that cooperation by all concerned represents the best solution, Dr. J. B. Edmonson, of the University of Michigan, reports that health education and medical care for children in the public schools have raised problems to perplex officials.

One of these is possible conflict with the teachings of certain religious groups. Seven such issues are discussed by Dr. Edmonson in the current issue of *School and Society*.

1. How complete a program of health education and care should a school provide for all children? Here is a major question magnified by the present tendency to transfer responsibility from home to school.

2. Should the health objective or the recreational objective be the controlling aim in the school's program of physical education? Important particularly in the training of teachers for physical education is this matter.

3. What are the health facts having scientific endorsement that should be presented to pupils and what health habits should pupils be helped to form or strengthen? Material for such teaching should be free from the influence of propaganda groups. Dr. Edmonson indicated that at present health instruction is subject to suspicion by teachers, parents and medical men.

4. How much knowledge of health matters should a classroom teacher be required to possess? It is the classroom teacher who must watch for defects and see that they receive attention.

5. To what extent must the schools avoid health instruction that conflicts with the teachings of religious groups? Dr. Edmonson urges patience, tolerance, generosity and good will in handling this question.

6. Should school officials or other governmental officials be given the legal authority to require pupils to secure needed dental or medical attention when the parents neglect or refuse to provide the necessary care?

7. How can the most effective coordination of the community's health services for school children be brought about?

Dr. Edmonson points out that ''The best type of program is certain to be the product of the cooperative efforts of those who are concerned with the promotion of a high level of individual and community health.''

ITEMS

DELIVERING the official sermon before the gathering of the British Association for the Advancement of Science, the fourth ranking dignitary of the Church of England warned members that the world is now experiencing the worst period of suppression of scientific knowledge and truth in several hundred years. Scientists should participate in the social application of their discoveries, the Right Reverend C. F. Garbett, Bishop of Winchester, declared in urging upon them the necessity for defending freedom and tolerance, two of the cornerstones upon which scientific advance is based.

SCIENTISTS attending the British Association meetings saw a successful demonstration of an automobile without a clutch. Designed by Professor F. C. Lea, engineer of Sheffield University, the car uses a mechanism called a torque converter to transmit power from engine to wheels. The engine operates a centrifugal oil pump, speed of which is controlled by the accelerator which varies the amount of oil delivered to a turbine attached to the drive shaft. Should the car prove commercially feasible its introduction would mark one of the greatest changes in the automobile in the last ten years.

AIMING to make the first complete day and night records of Old Faithful's performance, Yellowstone National Park employees are installing air temperature, air pressure and interval-recording devices on the cone of the world's most famous geyser, Park Naturalist C. Max Bauer announced. The weather instruments will keep graphs of temperature and air pressure so that naturalists may determine the effects of these factors on eruptions, which now take place approximately every 66.5 minutes. The interval-recording device will work both day and night.

TASS reports that bacteria in the trunk, mouth, digestive tract and other parts of the frozen mammoth carcass recently found on Wrangel Island in the Arctic will be studied by Professor Karapetev, of the Soviet Academy of Sciences, as soon as it has been brought to Vladivostok. Professor Karapetev believes that he can revive the microorganisms and also parasites frozen upon the exterior of the body, as he has revived lower plant and animal forms found in the permanently frozen soil of Siberia.