occasionally an intermediate globulin with $s = 9 \times 10^{-13}$. Whether the Felton globulin with $s = ca\ 15 \times 10^{-13}$ represents an alteration or an association product involving one of these normal globulins or is a totally new protein can not of course be told from the present experiments. No molecular species sedimenting faster, and thus having a larger weight than the Felton globulin, could be found in any preparation. These experiments demonstrate that the globulins present in Types I, II and VIII concentrates have approximately the same sedimentation constants. Some samples, however, contained antibodies against more than one type so that additional experiments with monovalent preparations are being carried out to ascertain whether small differences characteristic of type can be detected.

All the Felton antibody concentrates also contained a considerable quantity of ultra-violet absorbing material sedimenting more slowly than the lightest protein molecules in normal horse serum. This "uncentrifugable" material, which very possibly consists of split products introduced by the concentrating procedures accounts for about 30 per cent. of the total ultra-violet light absorption.

Normal horse serum treated by the Felton procedure gives only a very small globulin yield. This yield is, however, materially increased if the final precipitation is made after a slightly more alkaline pH adjustment. When ultracentrifuged, such normal globulin concentrate is found to contain two components, one with $s = 17 \times 10^{-13}$, the other with $s = 9 \times 10^{-13}$. It is quite possible that these are to be identified with the two heavier globulins found by Mutzenbecher.

We have also examined a purified antibody[9] obtained from a rabbit immunized against one of the azoproteins of Landsteiner and van der Scheer.[10] The sedimentation pattern of this material, which was supplied by Dr. K. Landsteiner, shows but one molecular species. Its sedimentation constant, 7×10^{-13}, does not differ from that of the lightest and principal globulin in normal sera.

CONCLUSION

The sedimentation constants from the ultracentrifugal analysis of several concentrated antibody preparations are of the same order of magnitude as those of the globulins of normal sera. If these antibodies are proteins or are associated with proteins and if concentration has proceeded till such proteins are a major constituent of these preparations, then it follows that antibody properties are not necessarily associated with exceptionally large molecular size. A more detailed account of these and related experiments will be published later.

J. BISCOE
FERD. HERČÍK
RALPH W. G. WYCKOFF

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH
NEW YORK, N. Y.

[9] This antibody was made by a modification of the method described in K. Landsteiner and J. van der Scheer, *Jour. Exp. Med.*, 63: 325, 1936.

[10] See K. Landsteiner, "The Specificity of Serological Reactions" (Thomas, Springfield, 1936).

THE ORGANISMS OF CHROMOMYCOSIS OF NORTH AND SOUTH AMERICA[1]

THE organisms responsible for the disease known as chromomycosis (chromoblastomycosis) or dermatitis verrucosa are perhaps as confusing to the clinician and mycologist as the fungi producing the infectious condition known as blastomycosis. Heretofore, the exponents of the microbes of this malady have classed only two organisms as causative agents. One, *Phialophora verrucosa,* was described for the first time in the United States by Thaxter from a case of Medlar, and the other, the much disputed *Acrotheca Pedrosoi,* was described in South America (Brazil) perhaps for the first time by Pedroso in 1911.

The organism of North American chromomycosis has withstood any change in nomenclature, and since its first description in 1915 has been isolated from a second case in the United States in 1933 and reported by Wilson, Hulsey and Weidman from Texas. In the same year (1933), the same fungus was isolated from the disease in Montevideo, Uruguay, by MacKinnon. *Acrotheca Pedrosoi,* on the other hand, was first named *Hormodendrum Pedrosoi* by Brumpt in 1921. In the following year, Terra Torres, Fonseca and Leão found conidiophores suggestive of *Acrotheca* and changed the name. In 1929, Langeron in France studying the culture obtained by Brumpt from Brazil found on liquid media indications that suggested characteristics of *Trichosporium,* and the name was again changed to *T. Pedrosoi.* Since then, the three names have been used interchangeably for the same microbe, with *Acrotheca* perhaps dominating. Weidman in his publication suggested that perhaps these two organisms were different form genera of one and the same species, which in the light of present observations is quite possible.

Unfortunately, from a mycological, nomenclatorial point of view, a good comparative, cultural study of the fungi of North and South America had never been made. While in São Paulo, Brazil, the opportunity presented itself to make such a study, with Floriano de Almeida, of the organism of Thaxter and several from South America, including Brazil, Uruguay and Argentina. Several interesting facts arose as a result.

[1] A study made by the author while in Sao Paulo, Brazil, as a John Simon Guggenheim Memorial Foundation fellow.

In the first place, it was found that *Phialophora* is not limited to North America, as MacKinnon was able to point out in Uruguay. One of the original cultures of Pedroso and Gomes, described as *Acrotheca* by Fonseca, we found to be *Phialophora*. A fungus recently described from Buenos Aires presents characteristics which are clearly those of *Phialophora*. In the second place, a careful examination of fungi described as *Acrotheca* revealed properties, such as branching, successive conidiophores and conidia in head formation, which are definitely not those of the genus, but more related to the large heterogeneous *Botrytis*. Due to additional characteristics which are those of the Dematiaceae and not of the Mucedinaceae, a new genus is proposed, namely, *Botrytoides* Moore and Almeida, to replace *Acrotheca* and *Trichosporium* for the causative organism of chromomycosis. Thirdly, the genus *Hormodendrum* has been isolated from authentic cases of this disease. Finally, a microbe isolated from a recent case in São Paulo has characteristics common to all the above-named genera.

When first grown, the new fungus appears much like *Trichosporium* as described by Langeron, a characteristic which, if interpreted correctly, however, is not consistent with that genus. When examined carefully on several media, the conidiophore of *Botrytoides* is clearly visible, and further, the type of spore formation of *Hormodendrum* is discernible. On several media, particularly Czapek's, in addition to these facts, the cup formation of conidia production is quite marked, appearing on approximately the twelfth day. This is distinctly a property of *Phialophora*. On Sabouraud's maltose agar the cup formation is seen almost exclusively, while on still other media, no cups, but branching conidia or conidiophores similar to those of the genus *Acrotheca* are found. For this complicated new organism, which apparently suggests itself as a missing link that binds *Botrytoides, Phialophora* and *Hormodendrum* in close relationship, the name *Phialoconidiophora Guggenheimia* Moore and Almeida, new genus and new species, is given. The species is gratefully dedicated to the John Simon Guggenheim Memorial Foundation for making this study possible.

MORRIS MOORE

THE BARNARD FREE SKIN AND CANCER HOSPITAL
ST. LOUIS, MO.

DIFFERENTIAL SUSCEPTIBILITY OF LIVING ORGANISMS TO SUPERSONIC VIBRATIONS

GRADED differentials in susceptibility to a large number of physical and chemical agents, not differing specifically with different agents, are very generally characteristic of the polar axes of animals at least during the earlier stages of development and in some of the simpler forms throughout life. A respiratory gradient and a gradient in rate of reduction of vital dyes as well as various other differentials have been found to parallel closely the susceptibility gradient in animals from which data have been obtained. In view of these facts, it is of interest to determine whether a differential susceptibility to supersonic waves, a primarily mechanical factor, exists.

In the experiments described below a modified Hartley oscillator circuit employing a 100-watt tube operated by raw alternating current was used to drive a large quartz crystal at its natural frequency of 612 kilocycles per second. The crystal was mounted between two heavy brass electrodes and served as a microscopic slide on the insulated stage of a grounded microscope. The lower electrode had a circular opening to permit a beam of light to pass through. The upper grounded electrode, when placed on the crystal, formed the wall of a cavity or cell for holding the experimental animals in water. The arrangement was held in place by a wooden frame soaked in paraffin. The intensity of the supersonic field was changed by modifying the input of the oscillator. A radio frequency milliammeter was used to give a rough measure of intensity.[1]

The temperature of water in the electrode cell rose approximately 6° C. during the average exposure required, but this rise was decreased to approximately 2° by introduction of a glass capillary tube cooling system. This rise in temperature during the few minutes of exposure which was required to observe the visible changes was not a factor in results. Control experiments with a similar rise in temperature and a period of exposure three times the usual experimental exposure showed no effects of temperature.

When *Euplanaria dorotocephala* is exposed to supersonic vibration the posterior tip and margins of the posterior zooid or zooids show disintegration first, and as the posterior zooid region disintegrates, disintegration begins in the head region by the cytolysis of the lateral margins and the auricles. Next the ganglionic region disintegrates, leaving the optic pigment visible for some time in the disintegrated mass of the head. Intact parts show strong muscular stimulation and profuse mucus secretion. Intense stimulation of the pharynx causes it to be extruded through the dorsal body wall and complete separation occurs, as with irritating chemical agents. The pharynx does not disintegrate, because it is thrown about the field by the wave patterns, and probably is not subjected to definite waves in one position long enough to show any effects.

The time required for disintegration varies with the intensity of the supersonic field and the condition of

[1] The cooperation of Dr. J. Barton Hoag, of the department of physics, University of Chicago, in construction of the apparatus is gratefully acknowledged.