

THE
RICE INSTITUTE
PAMPHLET

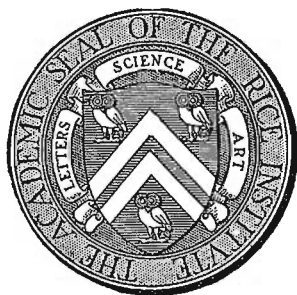
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THE RICE INSTITUTE

A university of liberal and technical learning
founded by William Marsh Rice in the City
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the advancement of Letters, Science, and Art

CONTENTS

	<i>Pages</i>
WILLIAM V. HOUSTON Address of Welcome	1- 3
ASA C. CHANDLER Introductory Remarks	4- 8
PAUL F. RUSSELL Man Against Malaria—Progress and Problems	9- 22
CECIL A. HOARE The Enigma of Host-Parasite Relations in Amebiasis	23- 35
CLARK P. READ Status of Behavioral and Physiological “Resistance”	36- 54
CLAY G. HUFF Host Influences on Some Haemosporidian Parasites	55- 79
LESLIE A. STAUBER Host Resistance to the Khartoum Strain of <i>Leishmania</i> <i>donovani</i>	80- 96
ROBERT M. LEWERT Invasiveness of Helminth <i>Larvae</i>	97-113
WILLIAM H. TALIAFERRO The Synthesis and Activities of Antibodies	114-140
JOSÉ OLIVER GONZALEZ AND ENRIQUE KOPFISCH Immunological and Pathological Phenomena Related to Substances from Tissues of <i>Ascaris lumbricoides</i>	141-150
IRVING G. KAGAN Contributions to the Immunology and Serology of Schistosomiasis	151-183
NORMAN R. STOLL The Induction of Self-cure and Protection with Special Reference to Experimental Vaccination Against <i>Haemonchus</i>	184-208

ADDRESS OF WELCOME

WILLIAM V. HOUSTON
President of the Rice Institute

IT GIVES me great pleasure to express the welcome of the Rice Institute to all of you here to help us celebrate the opening of our new biology building. For many of you this may be your first visit to the Rice Institute, and I hope we may have an opportunity to make you somewhat acquainted with our facilities and our activities. We are also happy to welcome back so many of our former graduate students; many of you, I am sure, will be pleasantly surprised to see the changes that have taken place on our campus since you were here before.

The name "Institute" is sometimes misleading, since we are not an institute of technology. We aim to be a small university, small in total numbers of people and small in that we confine our efforts to restricted fields largely of the traditional university variety. We are firmly dedicated to the proposition that size and excellence are not at all synonymous. In fact, we believe that we can pursue excellence better in a small institution than some can in institutions much larger.

I have recently come across what appears to me to be an interesting item concerning the early history of the Rice Institute. When Dr. Lovett was appointed the first President, in December, 1907, he resolved to take a trip around the world to view universities in foreign lands as well as in this country. At that time there seems to have been considerable interest in a Russian system of technical institutes. Consequently, he made a visit to Russia, and, in fact, went clear across Asia on the Trans-Siberian Railway to Japan, after viewing a number of Russian schools. His conclusion at that time was that he did not want to develop the Rice Institute along the Russian lines, but proposed instead to develop along the lines of more traditional Western European and American universities. Since Dr. Lovett was coming from Princeton, it was inevitable that many features of the Rice Institute should be similar to corresponding features at Princeton, and I believe the Princeton tradition is still strong among us. Whether our current interest in Russian education should lead us to the same conclusion, I am not now prepared to say, but I find this an interesting recurrence of an historical situation.

The principal way in which we cultivate our university nature is our emphasis on graduate work. We do graduate work to the Doctor's degree in most departments, although here again we try to be very careful that

graduate work is undertaken only when we have adequate facilities and adequate faculty, and to my mind the adequacy of the faculty is much the more important feature. We have been doing graduate work in biology for some thirty years. I was very happy, at a homecoming session last night, to welcome back so many of our former biology graduate students, many of whom have since had distinguished careers. Many of you I was enabled to meet for the first time, since compared with Professor Chandler I am a very recent newcomer.

Another of our features in which some of you may be interested is our newly inaugurated set of residential colleges. Our dinner last night was held in Baker College, and the dinner this evening is to be held in Wiess College. These colleges are not, of course, particularly connected with our program of graduate studies and research, but they are devised somewhat along the lines of the colleges at Yale, the houses at the California Institute of Technology, and remotely the colleges in Oxford and Cambridge, to provide an organization of undergraduate life most conducive to educational objectives. Dr. Talmage, Chairman of our Biology Department, is the Master of Weiss College, and has been active and intimately associated with the inauguration of this new activity.

This symposium, as well as yesterday evening's homecoming, has been arranged with two objectives in mind. The first, of course, is to show off the new building. The M. D. Anderson Biological Laboratories have been built with the aid of the M. D. Anderson Foundation. This Foundation, established by Monroe D. Anderson of this city, who died a number of years ago, has been one of the most active in the development of the Texas Medical Center and in the promotion of other worthwhile activities in this city. In particular, we have on our campus Anderson Hall, which houses the offices of many of our faculty in English, history, mathematics, languages, and architecture, and there is in the Medical Center the M. D. Anderson Cancer Research Hospital, of which I am sure many of you have heard. These are only some of the benefactions and contributions to Houston's development that are due to the Anderson Foundation.

Of course, a building is not the only thing. The building needs equipment, and we are happy to acknowledge the fact that adequate equipment for the research activities has been made possible because of a grant from the National Institutes of Health. Because of this grant, which is, of course, matched by similar funds from the Rice Institute, we shall be able to equip the building with research facilities much more satisfactorily than might otherwise have been the case.

On the other and, I think all of us here realize, and I would like to reiterate, that a building and its equipment constitute only an inert skeleton

for teaching and research in biology or anything else. There must be flesh and blood, muscles, nerves, and above all, brains. We can hope that these physical facilities will help us in our continuing effort to add to the Rice Institute faculty men whose creative abilities, whose intense interest, and whose human qualities will make them outstanding in the university community in the next fifty years.

I will always remember a comment once made by Linus Pauling in my hearing. He said that the last paper of many a distinguished chemist was entitled "The Plans for My New Building." Perhaps by sufficient emphasis on the fact that something needs to be done *in* a new building we can avoid falling into such a trap.

The second object in arranging this symposium is to pay honor, before his retirement, to Professor A. C. Chandler. Professor Chandler has been on the faculty of the Rice Institute since 1919, and during that time his energy, his spirit, have been the driving force behind our activities. He is not yet retired, and will not retire for several years. However, it is our custom to rotate the chairmanships of departments, and, in particular, to ask a chairman to retire from that particular position some five years before his official retirement date. One of the objectives of such a scheme, in my mind, is to emphasize our regard for the professorship, rather than the administrative chairmanship, as the distinguished position. Somebody has to do some administering. It is a time-consuming and nerve-racking operation, and its function is to make it possible for other members of the faculty to do their jobs of teaching and research in the most effective way. This chore Professor Talmage has taken over for the past two years, leaving Professor Chandler free to devote himself to his teaching and research activities. Because of Professor Chandler's long and distinguished career here it has seemed quite appropriate that this symposium should be on the subject to which he has given his life's attention.

Again let me welcome all of you here today and to thank you for joining with us in these two objectives.

INTRODUCTORY REMARKS

ASA C. CHANDLER

The Rice Institute

Ladies and Gentlemen,

IT IS with very great pleasure that we welcome you here today. We are delighted to greet many old and distinguished friends who have come to help us celebrate an event that is at once a monument to our past efforts in biological teaching and research, and a challenge to still greater efforts in the future: the opening—or at least the approaching opening—of our new Biology Building. To us this new building is a veritable dream come true. As one of our symposium speakers very cleverly put it, the present symposium serves as the background music to accompany our being carried by our generous benefactors over the threshold of our new home.

The Rice Institute opened its doors in 1912, as an institution dedicated to the advancement of *Letters, Science and Art*—a monument to the generosity and foresightedness of one of Houston's most prominent pioneers, Mr. William Marsh Rice. The Biology Department had its beginning in the following year, when our first Professor of Biology, Dr. Julian Huxley, gave a freshman course to a class of 31 students. By 1915 our Biology staff had grown to three, including Dr. H. J. Muller, subsequently, as you know, a Nobel Prize winner in genetics. Dr. Huxley left in 1916 to serve his own country in her hour of need during World War I, and was replaced by Dr. Edgar Altenburg, who has had a long and distinguished career in genetics, and whom we still enjoy as a colleague. In 1919 I came here to replace Dr. Muller and, except for temporary sojourns in India and Egypt, have been here ever since. While I was in India Dr. R. P. Hall joined our staff, and while I was in Egypt we were honored by the presence of Dr. George R. LaRue. In 1928 Dr. M. A. Stewart, now a dean at the University of California in Berkeley, was added to our staff. We continued with a staff of three for a long time; this included at one time or another Dr. I. C. Kitchen, Dr. E. S. Deevey and Dr. E. J. Eversole. In 1940 Dr. J. I. Davies, who had come over with Dr. Huxley and had been an assistant, became a fourth member of the staff. He is still one of us and is with us today.

During this period we had only from two to four graduate students at a time, but many of these have subsequently distinguished themselves and are well known to the majority of the parasitologists in this audience. One

of these, our first, Dr. Paul D. Harwood, will preside at our session this afternoon. I also wish to pay tribute to Mrs. Evelyn Hake, my research assistant since 1931; without her clever technical help our output of work in parasitology and immunology would inevitably have been far less, as I know our former graduate students, here today to join us on this auspicious occasion, will whole-heartedly agree.

After World War II, when Dr. Houston joined us as our second President, and when the foresightedness of our trustees and the generosity of various benefactors made it financially possible, we began an expansion which has not yet run its full course. Our present highly efficient and progressive department chairman, Dr. Roy V. Talmage, endocrinologist, joined us in 1947; Dr. Jack Daugherty, whose work on physiology of parasites is well known to you, came a year or two later, then Dr. Allen Enders, primarily an histochemist, and, latest, Dr. Jorge Awapara, a biochemist. In addition, Dr. Hugh C. Welch has for many years been a lecturer in biology for our Physical Education division. In the not too distant future we hope to add one more member, in the field of microbiology. Meanwhile our number of graduate students has increased to a dozen or more, plus one or two postdoctoral fellows, and we average something like twenty published research papers a year.

With this expansion our work in our old quarters has been seriously hampered by lack of space. Our situation has been worse than that of sardines in a can, for there each sardine at least has a place to sit tight and call his own. But we couldn't do that—we have one laboratory in our old building in which five different lab courses are given on five successive days of the week. When we get in our new quarters I hope we don't explode too badly from sudden release of pressure!

In our new building we shall be able to accommodate a number of postdoctoral fellows and twenty or twenty-five graduate students. We anticipate that our new building will stimulate greatly the research program in our department. While a broad and diversified undergraduate program is planned, it is expected that the research endeavors will be restricted to complementing fields because of the modern demands for teamwork in research. Prime emphasis will be placed on the physiological sciences, genetics, microbiology, parasitology, and related fields. We expect that within a few years even the greatly expanded facilities in our new home will be stretched to capacity, for the very availability of these facilities and our enlarged staff will attract more graduate students and increase our research activity.

The present symposium, as you all recognize, is in the field of work in which I and my graduate students have been particularly interested for the past twenty-five or thirty years. I wish to take this occasion to

express my deep appreciation for this tribute on the part of President Houston and of my colleagues in the Biology Department. It is a gratifying recognition of the contributions we have made in this field.

Our work on resistance and immunity began with a series of experiments, published in 1932, on the nature of the resistance of rats to superinfection with the nematode, *Nippostrongylus muris*. A year prior to this Dr. Schwartz, who is honoring us with his presence here today, and his colleagues had already demonstrated (Schwartz *et al.*, 1931), in a paper that at the time escaped our attention, that after a single infection with this nematode, and increasingly with subsequent infections, the host built up a resistance that manifests itself by retardation of growth, development, and reproduction, and postulated the development by the host of a specific growth-inhibiting substance or substances. They also expressed the opinion that a similar mechanism of resistance would be found in other nematode infections. Here at Rice Institute we continued work on the details of this newly demonstrated type of resistance in a series of papers published from 1935 to 1938. In 1935 (Chandler, 1935) we came to the conclusion that many of the phenomena manifested in superinfections—stunting in growth, retardation of development, inhibition of reproduction, and failure of successful migration through the body—might be the result of interference with nutrition, and might be due to the development of anti-enzymes which inhibit the activity of the enzymes by means of which the parasites digest and assimilate the host's protein. We felt therefore that immunity to helminthic infections was due to an antibody reaction, not to the body substance of the worms, but to metabolic products—excretions or secretions; and we suggested that the inhibition of reproduction of *Trypanosoma lewisi*, which Dr. Taliaferro and his associates had demonstrated in a brilliant series of researches (Taliaferro, 1932), might be a similar phenomenon. We feel that we have recently demonstrated (Thillet and Chandler, 1957), at least to our satisfaction, that this surmise was correct, and that the action of ablastin is in every way comparable to the inhibition of growth, development and reproduction in *Nippostrongylus* and other parasitic nematodes. In the latter case the demonstration by Sarles and Taliaferro of precipitates in excretions and in the intestine of *Nippostrongylus* larvae immersed in immune serum confirmed our ideas. Since then a similar phenomenon has been demonstrated in numerous nematodes, as well as in schistosome cercariae. In more recent years direct evidence for the role of excretions and secretions of helminths in stimulating an immune response in the host, which Chipman in her 1957 paper referred to as a generally accepted view, has been provided by Thorson (1953) for *Nippostrongylus*;

by Thorson (1956) for *Ancylostoma caninum*; by Campbell (1955), Chute (1956) and Chipman (1957) for *Trichinella*; and by Levine for *Schistosoma mansoni* (quoted by Kagan, 1958).

In 1939 and 1940 we began work on immunity in *Hymenolepis diminuta* infections (Chandler, 1939, 1940), in which evidence was adduced against any antibody response to these inhabitants of the intestinal lumen; this was extended to the acanthocephalan, *Moniliformis dubius*, by Burlingame (1941). In 1952-1954 some very interesting observations were made by Heyneman (1954) on immunity in *Hymenolepis* infections, particularly with reference to the difference in the course of *Hymenolepis nana* infections when induced by feeding of eggs, thus involving a parenteral phase when the cysticercoids develop in the villi, and when induced by beetle-reared cysticerci when the infection is confined to the intestinal lumen. A particularly interesting observation was the fact that lumen-dwelling worms, either *H. diminuta* or *H. nana*, though incapable of stimulating immunity, were affected to some degree by the immunity resulting from prior development of *H. nana* cysticercoids in the villi.

We have played around with immunity in many other infections, including work by Dr. Schuhardt (Schuhardt and Wilkerson, 1951) on spirochetes, though this was done after he left the Institute; by Dr. Thillet (Thillet and Chandler, 1957) on *Trypanosoma lewisi*; by Dr. Healy (1955) on *Fasciola* infections; and by Mr. Esslinger, presently working on screwworms. These men, too, are in our audience today. We are presently working also on immunological phenomena in *Entamoeba* and *Trichomonas* infections. An important factor in making our contributions to parasite immunology possible has been, and is, the series of generous research grants that we have received from the National Institutes of Health. It is a pleasure to acknowledge this aid and publicly express our appreciation before this audience.

From what I have said you will readily understand why we are so pleased to have the whole subject of resistance and immunity in parasitic infections discussed here today and tomorrow by the leaders in this field of work, and also why we are so pleased with the response to our invitations by fellow workers in all parts of our country. This symposium is a very great treat for us, and we hope it will be for you.

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