of specific findings and their correction and operation. But of all of it, relatively little is said and sought. We have our own specific concepts for the aggregate of events, and "psychology" includes the science of the way in which the functioning also deals with itself, as our mentation with its wealth of sign-function that works not only as a tool, but rises from our dialects or intimate and local means of interchange to our more widely comprehensive and intelligible conceptions in which we can transact our business and finally evolve the very science and critical thought and planning on which our conduct of life feeds and prospers. This part is essentially that of the representation of the sharable preparedness to muster what as individuals and groups we include in our nature in behalf of the regulations of "history in statu nascendi," the shaping of human fate.

To do justice to the remarkable assemblage of the free expression of sixty-eight contributors would mean a huge task and deserve something more like a book than a review, but even better, a succession of reviews or symposia on the symposium.

The problem is of such vital and far-reaching importance that the American Association for the Advancement of Science would render a real service by appointing for a time a representative committee that would give a follow-up report from time to time aiming at digestion and the further development of appetite and orientation in the field: a committee on man's health as person and group—with a promotion of a psychology and a psychiatry and their foundations and bearings worth cultivating and consulting in behalf of the health of man and his civilization, not only as techniques and means of formal management but also its intrinsic logic and meaning. Out of that may arise a more widely permeating understanding of the interrelations in behalf of man of the sciences which the association brings together in its annual meetings. It would cultivate opportunities for the collateral sciences to help in the orientation among the actual workers rather than reiterations of the old prejudices used for false and ineffective self-excuse and perpetuation of reciprocal isolation.

The symposium deserves wide-spread attention and our gratitude to the organizers and contributors, and perhaps fully as much to those who challenge critical thought, as to those who give us the already available perspectives and the positive lifts and techniques.

OBITUARY

HANS ZINSSER

Bacteriologist, teacher, philosopher, author, poet, soldier

November 17, 1878—September 4, 1940

He who is plentifully provided for from within needs but little from without.—*Goethe.*

HANS ZINSSER, Charles Wilder professor of bacteriology and immunology at the Harvard Medical School, died of lymphatic leukemia on September 4, 1940, at the Memorial Hospital for the Treatment of Cancer and Allied Diseases in New York City, where he had been a patient for the previous two weeks. During the summer he continued at work in his laboratories at the Harvard Medical School up to August 16, about the time of his departure for the hospital in New York.

By his death, the medical profession has lost one of its most brilliant and versatile personalities. It is difficult in a brief obituary notice fully to analyze and estimate his accomplishments, as he achieved success in many fields. He was internationally recognized as one of the most distinguished bacteriologists and scientific investigators of his age; he was acknowledged as an authority on medical education; he was an inspiring and dynamic teacher; he was generally conceded a leader in preventive medicine and in the direction of medical research. As an author, his great literary ability and originality have been universally recognized, and his last work, his autobiography, was selected as the "Book of the Month" for July.

Dr. Zinsser was born in New York on November 17, 1878, the son of August and Marie Theresia (Schmidt) Zinsser. In June, 1905, he married Ruby Handforth Kunz of New York. He is survived by his widow, a son and a daughter. The son, Hans H. Zinsser, is a second-year student at the Harvard Medical School and was married in June of this year to Anne Drinker, daughter of Dean Cecil Kent Drinker, of the Harvard School of Public Health. His daughter is the wife of Vernon Munroe, Jr., of New York City.

Dr. Zinsser was graduated from Columbia University with the degree of A.B. in 1899. He received the degree of M.A. from this university the same year that he received his M.D. from the College of Physicians and Surgeons (Columbia). After an internship at Roosevelt Hospital, N. Y. (1903–1905), he held bacteriological positions in New York at the Roosevelt Hospital (1905–1906); assistant pathologist, St. Luke's Hospital (1909–1910); and Columbia University (1905–1906, 1908–1910). In 1910 he went to California to become professor of bacteriology at Leland Stanford University, returning to Columbia in 1913 as professor of bacteriology and immunology, until 1923. He became professor of bacteriology and immunology at Harvard Medical School, Boston, in 1923, and Charles Wilder professor of bacteriology and immunology in 1935.

He received the honorary degree of doctor of science from Columbia University in 1929, Western Reserve

University in 1931, Lehigh in 1933, Harvard in 1939 and Yale in 1939. In conferring the honorary degree at Harvard, President Conant said of him: "A dynamic teacher whose vision extends beyond his laboratory; a famed investigator of the secret ways of man's microscopical enemies." At Yale, Professor William Lyon Phelps, conferring the degree, said in the course of his remarks: "He is one of the foremost laboratory scientists, and in the midst of his war against disease he has made friends everywhere in the world; his chronic courage is salted with humor; for although he is a medical philosopher, we may say of him what Edwards said to Johnson, 'cheerfulness is always breaking in.'"

He was a member of the American Red Cross Sanitary Commission to Serbia in 1915, and during the World War he served as Major and later as Colonel of the Medical Corps of the A.E.F., 1917–19. In 1923 he went to Russia as a sanitary commissioner for the Health Section of the League of Nations. In 1935 he was an exchange professor to France. He was awarded the Distinguished Service Medal of the United States, the Chevalier of the French Legion of Honor and the Serbian Order of St. Sava.

At the time of his death, in addition to holding the position of professor of bacteriology and immunology at Harvard, he was chief of the bacteriological services of the Children's and Infants' Hospital, consultant in bacteriology at the Peter Bent Brigham Hospital, and a trustee of the Massachusetts General Hospital.

He was a member of some 36 scientific societies, including the Association of American Physicians, American Academy of Arts and Sciences, National Academy of Sciences, American Academy of Tropical Medicine, American Association for Advancement of Science and the American Association of Immunologists (president, 1919).

In 1915 a great change came into his life, which obviously markedly influenced the later years of his work. As he himself wrote: "I felt I ought to get into the war in some capacity, and my chance came in March, when" there was "organized the Red Cross Typhus Commission for Serbia." Writing of his experiences at that time in regard to the Serbian epidemic, his "first experience of mass misery," while he refers to it as "as terrifying and tragic an episode as has occurred since the Middle Ages," his reminiscences of it (he says) are on the whole rather prosaic. Afterwards his great interest in the disease continued until the end. One sees this in the time and energy he devoted to his book, "Rats, Lice and History," which has been referred to as "the biography of a disease" and as a popular history of typhus. In the closing chapter of that book, he writes: "Not every one realizes that typhus has at least as just a reason to claim that it 'won the war' as any of the contending nations." It was well known to us in Serbia in 1915 from various sources that the Austrian and German armies were only waiting the subsidence of the typhus epidemic before crossing the Danube and invading the country, for the Allies had done nothing to reinforce the Serbian troops and prevent such an invasion of their country. In regard to this situation, Dr. Zinsser wrote:

> During all this time Serbia was practically helpless. Yet Austria did not attack. Austrian strategists knew better than to enter Serbia at this time. The probable results were obvious. Typhus—while scourging the Serbian popuatilon—was holding the border. The Central Powers lost six months during the most critical time of the war. It is anybody's guess as to the effect which this delay may have had on the early Russian and even on the Western campaigns. It is at least not unreasonable to believe that a quick thrust through Serbia at this time—with its reactions on Turkey, Bulgaria and Greece—the closing of Salonika, and the establishment of a Southwestern front against Russia might have tipped the balance in favor of the then very vigorous Central Powers. Typhus may not have won the war—but it certainly helped.

Dr. Zinsser's travels and studies, not only in Serbia but in Russia, Mexico and China, also especially enhanced his interest in the typhus group of fevers.

During the past ten years he had especially devoted his attention, and directed that of a number of his associates, to the problems of animal reservoirs, methods of transmission and immunization of the diseases of the typhus group, and has made some thirty-three original contributions, generally with his associates (especially Castenada) upon these subjects. As early as 1930, with some of his associates, he demonstrated that an active immunization against the murine or European varieties of typhus fever could be produced in animals with formalinized suspensions of the respective micro-organisms. In a paper published with Plotz and Enders in SCIENCE (January 12, 1940), which should be read in detail, various steps in the progress made by different investigators employing different methods for the mass production of typhus vaccine of the European type are outlined. The method finally recommended for securing large numbers of Rickettsiae consists of a combination of the agar tissue procedure of Zinsser, Wei and Fitzpatrick (1937), and of Cox (1938) of yolk sac culture, somewhat modified and employed as a source of inoculum.

At the time of publication of this last article, a number of daily newspapers wrote lengthy articles emphasizing the importance of the discovery. Dr. Zinsser, however, in an interview the following day, modestly deplored the publicity attendant upon the work, saying that it was merely a short step forward, based on the long and patient efforts of many people in different parts of the world.

His exceptional scientific attainments as an author

have been well known to the medical profession for many years, not only by his individual contributions to journals, upon bacteriological research and the study of infectious diseases, but especially by his text-books. He has been a prolific writer of scientific articles since 1903, having contributed some 176 papers in the current journals. His "Text Book of Bacteriology," first published in 1910 and now in its eighth edition[1] presents in a clear and concise manner the fundamentals of bacteriology and immunology and the application of this knowledge to the understanding and control of infectious diseases; in addition, emphasizing the conception of medicine as a division of biological and social sciences in relation to other sciences. I do not know of a better text-book written on the subject, and it has proved almost indispensable, especially to physicians and students of bacteriology and preventive medicine.

His "Resistance to Infectious Disease" was published first in 1914 and was affectionately dedicated to his father, "A.Z." A second edition appeared in 1918, and a third in 1923. A third text-book, rewritten and now in its fifth edition under the title of "Immunity: Principles and Application in Medicine and Public Health"[2] constitutes a practical treatise upon the biological phenomena of infection and recovery of the animal body from infectious disease, with the consideration of the application of the principles of immunity to diagnosis, treatment and prophylaxis and their usefulness in the control of epidemics. This text-book has also proved of inestimable value to medical students, laboratory workers and students of public health.

Although his life has been an unusually busy one in active research and the direction of the work of others in his laboratory, as well as in teaching, the fact that these two text-books have been kept very fully up to date is another evidence of his great vitality, energy and capacity for hard work.

Dr. Zinsser was one of the principal participants in the symposium held at the Harvard Medical School of public Health on "Virus and Rickettsial Diseases" in June, 1939, and wrote not only the introduction to this volume, published in 1940, but also the two chapters on "The Immunology of Infections of Filtrable and Virus Agents" and "Epidemiology and Immunity in the Rickettsial Diseases."

Recently he had attained spectacular success as a writer in the authorship of two "best sellers"—"Rats, Lice and History" (1905) and his autobiography, "As I Remember Him; The Biography of RS," published during the present year.

This last book has been referred to as the conscious obituary of a man who knew he had but a comparatively short time to live, and in it he has described in the third person the pleasure and satisfaction he gained from various incidents as he approached death. He had been writing this book intermittently for some years, but had intensified his efforts since his return from China in June, 1938, when he and his physician recognized definite symptoms of lymphatic leukemia. However, instead of retiring to a life of leisure and rest, he continued his work in his laboratories and upon this book, with at times even more than his usual vigor. On occasions when stricken with weakness it was necessary for him to spend several days in a hospital and undergo x-ray treatment for the disease that was daily sapping his strength. After such treatment, when he had recovered somewhat from the shock of the treatment, the condition of his blood frequently became temporarily improved and he would return to his laboratory work. Such a life he led with full knowledge that he had only a comparatively short time to live. Courageously he continued to work and write, although anticipating his death. Only a few months ago, when a number of the chapters of his last book had appeared in the *Atlantic Monthly*, he spoke of these facts and then at the same time of the satisfaction he was still having in writing it. Such quiet, steadfast courage as he displayed in his daily life cannot be surpassed or forgotten. For, as he himself wrote of Francis Weld Peabody, "Courage is still, as it always has been, a thing of great beauty that springs, whatever its form of expression, from an inner source of moral power."

During the past summer, he drove his automobile from his home to his laboratories at the Harvard Medical School each day, pursuing his work, and in the evenings and on certain holidays saw his friends and lived the life of a man keenly interested in everyday affairs. When he went to New York to undergo another form of treatment a few weeks ago, while referring to it in a way as a vacation, he intimated to a very few that the treatment might be experimental and that he might not be able to return.

One of the earliest ambitions of Dr. Zinsser was apparently in the direction of literature. He has been a writer of verse for years, and during the past fifteen years has contributed twenty-four poems and sonnets to the *Atlantic Monthly*. His last sonnet from that magazine, published in 1940, reveals a depth and sweetness and tenderness that, alas, few of us had realized him to possess, and in it there is evidence of a mastery of form and feeling that marked him truly as a poet of great ability.

Morris Fishbein, editor of the *Journal* of the American Medical Association, in referring to "As I Remember Him," writes: "It is a medical biography to take its stand as a classic beside the Vallery-Radot "Life of Pasteur," the Paget "Sir Victor Horsley" and

[1] "Text Book of Bacteriology," by Hans Zinsser and Stanhope Bayne-Jones, Appleton-Century Company, 1939.
[2] By Zinsser, Enders and Fothergill, Macmillan Company, 1939.

indeed even the Cushing "Life of Sir William Osler." It is as fine a contribution to autobiographic writing as I have known.

Dr. Robert M. Green, associate professor of anatomy at Harvard, also writing of this book, asks: "Can any man be wholly known to his contemporaries? Oliver Wendell Holmes, autocrat, anatomist, and poet, wrote that each of us has at least three personalities: one as he is known to his maker, one as he is known to his fellow men, and one as he is known to himself. It is this third intrinsic personality of RS which Dr. Zinsser from long acquaintance and intimate documents has revealed. Out of an alembic mixture of recollection, personal confession and observation, he has recreated for us the real self of a man whom we have long admired and loved, but not fully appreciated."

Many of us are sensible of and in accord with this statement, and those of us who have been acquainted with Dr. Zinsser during the past few years recognize from his last writings not only elements of his character that we knew, but in addition other traits apparent, the existence of which we had not even realized or appreciated. For as he once wrote, as Carlyle says of Schiller, "the man's heart which few knew was as true and noble as his genius which all knew."

Dr. Zinsser, in his last chapter, in which the end of the life of RS is described, relates that during the last months his philosophy ripened and that he achieved a certain degree of philosophical tranquility, revealing something of the sweetness and the light of love in his soul. Although moving further away from faith in any comprehensible conception of God, yet he grew closer to the conviction of the wisdom and guiding integrity of the compassionate philosophy of Christ. He "felt increasingly grateful for the fact that death was coming to him with due warning, and gradually. So many times in his active life he had been near sudden death by accident, violence or acute disease; and always he had thought that rapid and unexpected extinction would be most merciful. But now he was thankful that he had time to compose his spirit and to spend a last year in affectionate and actually merry association with those dear to him. He set down this feeling in his last sonnet:

> Now is death merciful. He calls me hence
> Gently, with friendly soothing of my fears
> Of ugly age and feeble impotence
> And cruel disintegration of slow years.
> Nor does he leap upon me unaware
> Like some wild beast that hungers for its prey,
> But gives me kindly warning to prepare:
> Before I go, to kiss your tears away.
> How sweet the summer! And the autumn shone
> Late warmth within our hearts as in the sky,
> Ripening rich harvest that our love had sown
> How good that 'ere the winter comes, I die!
> Then, ageless, in your heart I'll come to rest
> Serene and proud, as when you loved me best.[3]

Dr. Zinsser lived a very full and unusually active life almost to the moment of his death, and the influence of his example and career will long continue. His deep faith in the power of honest scientific work to promote human welfare will long be a guiding light to others. His spirit will benefit humanity for many years to come, and no one who ever knew him will forget him.

RICHARD P. STRONG

SCIENTIFIC EVENTS

POLLUTION INVESTIGATIONS OF THE FISHERIES SERVICE

ACCORDING to *The Fisheries Service Bulletin,* Dr. M. M. Ellis, in charge of the service's pollution investigations in relation to aquatic life, reports that the field surveys carried out this summer have resulted in the collection of more material and more data than any previous trip. This success is attributed by Dr. Ellis, in part, to the use of new analytical methods and new physiological apparatus in the laboratory trucks from which the surveys were made.

During part of the month of July Dr. Ellis and his party visited the Black Hills region of South Dakota, where they cooperated with state officials in a study of gold-mine wastes in relation to stream conditions and fish life. A second problem investigated at the request of the state was the extent to which beaver dams modify stream conditions and water characteristics. Dr. Ellis reports that the beaver-dam problem in South Dakota appears to differ considerably from the situation in Michigan and other localities where these dams have been studied previously.

After collecting material related to the study of arsenic pollution at Gardiner, Mont., the field party proceeded to central Idaho for a study of irrigation waters from the Snake River, and thence to the Salmon River Valley to continue the studies of salmon spawning streams begun in previous years. Using Red Fish Lake in the Sawtooth Mountains as a base, the investigators were successful in securing much new data on these salmon spawning waters and also on waters frequented by the so-called redfish.

Mine-waste problems in the Coeur d'Alene region of Idaho engaged the attention of the field party for approximately ten days, after which it proceeded to Rock Island Dam on the Columbia River. Dr. Ellis has been following the changes in the water of the

[3] Quotation by permission of the *Atlantic Monthly.*