admitted that the training necessary to conduct successfully research in this line must be of a more thorough kind than is undergone by those of to-day who are preparing for a career in research in any one of the medical sciences, but it is not more than can be exacted of a capable student free, but under special direction, to give attention for a few years to special branches of the several sciences, the knowledge of which is required. That there are few so trained now is no indication that none can be. The training of physiologists, biochemists and pathologists has hitherto been largely determined by chance conditions. There has been no guidance in it and too often it has been of an elementary or very limited kind. Many of those so prepared have in their own specialties done considerable service in the way of research, but the problems that remain demand of those who attack them more thorough and wider knowledge along different lines and in consequence the preliminary training must henceforth be extended to cover all the different sciences or branches of them, a knowledge of which is concerned in such research.

Such a training would qualify as well for important lines of research in pathology, bacteriology, immunology, physiology, and pharmacology, for the highly trained worker is to be henceforth as necessary in research in these fields as he is in biochemistry, otherwise the yield in results of more than a narrow significance will be very scanty. Only thus can the blight of spelunculism in the medical sciences, which is now in prospect, be prevented.

To produce these researchers is the duty which must be undertaken by those in command of the various departments of these sciences in our leading universities. They must exact of the young students under their charge a higher standard of attainment if research in the causation and treatment of disease is to achieve greatly in the coming generation. The demand for investigators of this type will be urgent and insistent in the next two or three decades and the failure to train them will reflect on those controlling the advanced teaching in these sciences.

With even half a score of such highly trained researchers working in this new field in the next few years results would be obtained some at least of which would compare in importance with those which marked the history of medicine in the last seven decades. We would then have a greatly increased, perhaps a profound knowledge of the functions of the organ which serves as the Great Portal of disease in the body. This knowledge would make possible new and highly rational lines of treatment of a large number of diseases, it would enable us to lessen very greatly their incidence and with its aid a regimen might be devised which would delay in the individual senescence, and even death, it may be, indefinitely.

The call for research in this line is urgent, for only through it is another great advance in medicine possible.

A. B. MACALLUM

McGILL UNIVERSITY

BAIRD, THE MAN[1]

THE policy of the Smithsonian Institution under Professor Henry was to disperse as widely and freely as possible the worked-up material, and to enlist in the process of elaboration the aid and enthusiasm of every American naturalist, each in his special field.

To make this policy a success, such as it eventually became, required qualifications of no ordinary kind. Not only must the work of mediation be guided by the most advanced biological science of the time, but the individual intrusted with it must possess a spirit of impartial liberality, tempered by a sound discretion in business methods; a thorough knowledge and just estimate of men; an untiring patience to meet the peculiarities and caprices of the independent and often one-sided specialists whose cooperation was essential; a geniality to enlist the willing but unscientific collaborator; and an instant detection of humbug in every guise. Providentially for the future of natural science in this country, the need and the man met in the selection of Professor Baird. In qualifications for the work he stood preeminent—head and shoulders above any man of his time, and perhaps above all other scientific men of any time. He joined

[1] One of the addresses given at the meeting in commemoration of the one hundredth anniversary of the birth of Spencer Fullerton Baird, held in the U. S. National Museum on February 3, 1923.

to a marvelous faculty for systematizing business a capacity for steady and continuous work only limited by his waking hours. His frank, genial and wholly unaffected manner put the scientist and the laboring man alike at ease. Always busy, he yet always seemed to have time for a friendly chat with every comer. His memory appeared an inexhaustible storehouse of facts on every subject where any desired datum lay ready for his use. He knew every specialist in the country. Not only did he hold amicable relations with scientists actually at work, but one might think there was not a school boy of extraordinary genius for birds' nesting or fishing on whom he could not lay his hands.

His appreciation of the workers did not stop with the recognition of the character of their scientific results. It seemed as if in his mind he had an epitome of all the characteristics of mind and habit of each and every man. In the constant necessity of selection for this or that task or post, which the always increasing scientific activity of the time rendered more frequent from year to year, he was very rarely mistaken in his judgment. In his position he was called upon to advise in nearly all government appointments which had a scientific bearing, direct or indirect; and the total number of selections which he determined during his career must have been many hundreds, and have included nearly every available person among the younger generation of students. The most surprising element in it all, to those cognizant of the details, was the calm impartiality which he brought to the task. No thought of self seemed to enter into his calculations. To best fit the purpose was his sole criterion, the purpose always being the promotion of science, and it was a very crooked stick indeed which was not fitted by him to some honorable service, as opportunity served. Those who felt themselves the objects of his personal regard sometimes halted for a moment in comical dismay, perceiving themselves frankly moved, like chessmen, in directions which they would not themselves have selected, and did not altogether like, almost as if they were perfect strangers; but an overwhelming sense of Baird's entire devotion to the promotion of science, his perfect unselfishness, and his incomparable good judgment, always carried the day, and the final outcome never discredited his generalship.

These characteristics would have made a great administrator anywhere, but there were other elements in the problem. It is not so hard to select deputies, aids and workers of every kind when the work of the selector and that of the designated person form duly subordinated parts of a general scheme, or the parts are so constituted as to be capable of purely independent elaboration. But in scientific work, as every one knows, the spirit of emulation is strong; men work often with a single object in view, and the glory of its first elucidation is necessarily for one alone. Doubtless the substantial amity and concord which have prevailed among American naturalists is in part due to their scattered distribution, the vast and, until recently, virgin fields open to research, and the consciousness that there is plenty of work to occupy profitably every willing student and as many more. In scientific as in economic competition the rivalry grows more intense as unoccupied ground diminishes. Nevertheless, from the earliest times of American science there have been controversies, and naturally these have been more active among the leaders. Baird himself having been one of the most prolific contributors to the literature of systematic zoology in the United States, it is evident that in promoting the studies of others, and in holding as a trust for the general benefit the vast collections which passed under his control, opportunities must have been numerous for giving precedence to the progress of his own researches rather than those of others engaged in the same lines. In such cases, we believe, he never hesitated, and the decision against himself was in more than one instance known by him at the time to be of pecuniary as well as scientific disadvantage to his own apparent interests. He never spoke of this sort of self-denial, and it was in a majority of cases known but to a few persons incidentally connected with the researches in question.

If he guided the activity of others as one would use impersonal agencies in the pursuance of a definite end, he was not less exacting with himself. He not only offered freely to others, sometimes constructive rivals, the raw material of research which he controlled, but in many cases he put in the hands of those

whom he thought worthy his own more or less elaborated manuscripts, to use in their investigations, thus waiving his own priority in the field. His insistence on giving full credit to collaborators of every degree, both in publications and in records, labels and reports, was proverbial. To the tyro treading with uncertain step the entrance ways of science he was ever cordial; always a friend, guide and helper. While Professor Henry lived, the affectionate loyalty of Baird to his venerable chief was an inspiration to those about him.

That this faithful cooperation would not have been a matter of course with most men, however honest in purpose and devoted to science, will be more evident when it is understood that, notwithstanding the well-known views of Professor Henry, enforced by him on every possible occasion, a great museum actually did grow up on their hands, the inevitable result of the scientific activity promoted by Professor Baird. This museum, only after years of effort, and but shortly before Professor Henry's death, came to take its present semi-independent position, such as he would originally have assigned to it. Until this was consummated, Professor Henry's anxieties were very great. When, by Professor Baird's persistent effort, quiet tact and unremitting labor, a distinct organization was finally effected for the museum, it was felt by Professor Henry as the greatest comfort of his declining years. The possibilities of antagonism in such a situation are readily perceptible, and nothing could testify more clearly to nobility of character in both than the fact that such differences never germinated between these faithful servants of science.

When Professor Baird succeeded to the office, it was with a modesty almost amounting to timidity that he spoke of the opportunities and duties of the post. His kindly recognition of his juniors was only changed by the shade of seriousness due to increased responsibility. Only those who were engaged with him can realize what an amount and variety of labor he willingly undertook. During the period of Pacific railroad explorations and the activity of the Hudson Bay Company's people, fired by the enthusiasm of Kennicott during his sojourn in the north, collections and correspondence poured in upon Professor Baird in extraordinary quantity. Not alone was the shedding of its horns by the antelope on the western plains, or the nesting of the canvas-back among Alaskan marshes, the theme of eager letter-writing. The professor and the ladies of his household might often have been seen among the shops seeking novels for the army officer at some isolated post, a necktie for a northern voyager, or the dress goods for a wedding to come off on the banks of the Mackenzie during the crisp Arctic September. It may be imagined that in his home life Professor Baird was altogether lovable, and we can not help saying that not the least of the benefits conferred upon American science was embodied in the influence which extended from that home upon a host of boyish students gathered from year to year under the brown towers of the Smithsonian Institution, slender as to their resources, half Bohemian as to their living, let loose with little restraint in that great disjointed village, the Washington of fifty years ago.

We have dwelt on this occasion not on Professor Baird's scientific researches, his administrative successes, his creation of organized scientific agencies, like the Fish Commission and the present National Museum, nor on the fame and honors which came to him from far and near. We have left these things, which are evident and accessible, to others, and speak here of our impressions of the genius and traits of character which moulded his life and made it truly great. The latter are embalmed in the consciousness of his contemporaries, now so few; and are chiefly unrecorded, while the former may be found in reports and statistics. Two things his experience may be said to have lacked: he never had a personal controversy, nor, so far as we have ever heard or had reason to suspect, an avowed enemy.

WILLIAM H. DALL
SMITHSONIAN INSTITUTION

THE FOUR HUNDRED AND FIFTIETH ANNIVERSARY OF THE BIRTH OF COPERNICUS

NICOLAUS COPERNICUS, philosopher, philanthropist, financial expert and churchman, was born at Thorn, Poland, February 19, 1473. Under the patronage of his uncle, a bishop, he