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- WILLIAM TRELEASE
THE UNIVERSITY OF ILLINOIS

THE BIOCHEMIST ON THE HOSPITAL STAFF

DURING the past few years there has been gradually evolving in the general mind, and particularly the medical mind, the idea that the chemist is actually something more than a druggist or a detector of arsenic. The present records of the efforts directed towards an elucidation of the reactions of the human organism in health and disease, along the lines of chemical investigation, are an achievement that by their very import, if not their voluminousness, have forcibly directed the attention of the medical profession to the possibility that here is a line of attack worthy of notice. The rapid progress being made is adding so much to the fundamental knowledge of how the organism carries on its activities, that the solution of the many problems being brought to light is most turbid in the minds of the chemical physician and he is turning to the biochemist for clarification. Scientific medicine to-day acknowledges the fundamental value of chemistry in the fight for the prevention and cure of disease; it recognizes now, as never before, the need of ascertaining the basic facts concerned in body reactions and that the satisfying of that need rests in the intensive application of biochemical methods to the study of the human organism. Outside of diabetes there is a general lack of definite information concerning the intricate processes going on, giving rise to, or accompanying pathological conditions, and there is opening up a larger opportunity for acquisition of this information through the open-hearted cooperation between physician and scientist that is now becoming evident.

In view of these facts and since there is an increasing number of hospitals that are coming to realize that the optimum treatment for their patients depends not only in having at hand the means of attaining all possible data, but also that the hospital should be the center for investigation, and are adding to their staffs men specially trained in biochemistry, it seems apropos to discuss briefly some of the points these new alliances are bringing up.

The average physician dumps all chemists into one class, leaving the biochemists undifferentiated, considers them analysts and mentally determines their status on the hospital staff as one a little lower than the plant engineer, but somewhat better than a nurse, although lacking even a nurse's conception of medicine.

Somewhere, though just where I do not recollect, I have read a discussion in which the distinction was drawn between the types of workers in chemistry. It was there brought out that whereas a chemist is always an analyst, an analyst need not necessarily be a chemist, since a chemist is inherently a thinker in chemistry. On the hospital staff it is the chemist that is needed and it is the chemical specialist, the biochemist, for just as in the medical profession there are specialists devoted to certain types of disorders, so have we of the chemical profession divided ourselves according as our inclinations and training have fitted us to pursue certain more or less well defined lines of endeavor. The efficient biochemist, however, must be not only well founded in information and ability to think in terms of all branches of chemistry, but he must also be familiarly acquainted with the principles of physics and general biology. This is merely the groundwork and foundation, on it there must be erected the superstructure of a knowledge of morphology, physiology, bacteriology, pathology and the phenomena of normal and disturbed body functions. Only one with such training can be of maximum service in the field of hospital activities. To a man so equipped the opportunities for usefulness are large, and the full utilization of his services

can not but result in benefit to patients and science.

The question of what and how much routine analytical work should be placed on the shoulders of the biochemist is one of importance, and by routine analytical work is meant the regular and systematic chemical examination of every hospital patient. Routine work, it is true, must and should be done, for from such analyses it is possible to follow the progress of disease and the response to treatment. Moreover, it is from the accumulated mass data carefully correlated that the conclusions can be drawn leading to the understanding of fundamentals, but routine blood and urine analyses can be made by any skilled technician while it requires the cooperative efforts of the clinician and the medically trained biochemist to interpret the results. Now the biochemist being primarily trained for and adapted to research should not have his time so taken up with routine that he can give but meager attention to the outlining and carrying on of investigations. In fact I do not believe that this work should be a part of the duties of the biochemist, except in so far as the results are directly applicable to a certain specific problem, but that it should be done by a technician, leaving the biochemist's time for the investigatory cooperation essential for progress.

The fundamental purpose of the hospital is the cure or relief of the patient, and it should be the aim of the biochemist as an integral part of the institution to plan his work to that end. He has two points of view that are synchronous as to ultimate effect but different in immediacy. The one line is intended to throw light on the present condition and progress of the patient under treatment; it is individual. Correlated with this is the group study of specific disturbance in various individuals with the aim of acquiring information as to the general processes occurring in the disorder. These are the immediate objects of study. In addition, he should have in mind and as an object of his attention investigations along the lines of basic phenomena not connected with any individual

or specific pathological condition, but more with the point of view of contributing information as to fundamental functioning. The immediate proposition looms the larger because it is the more pressing. But who will say which is the more important? Logical planning will result in such an intimate dove-tailing of both the immediate and the basic lines of effort that the perspective of time will afford a well founded understanding of the causes contributing to disease, which understanding will lay the path for cure and prevention.

This can not be done nor can full development be obtained without a close cooperation of the other members of the hospital staff with the biochemist. And it almost goes without saying that this cooperation can not be effected unless the biochemist is equipped to understand the point of view of the clinician and is capable of giving to the clinician assistance in the working out of his problems. Progress can not be expected when the biochemist either by preference, or lack of opportunity to do otherwise, remains cooped up with his test-tubes and beakers knowing nothing of the patients save as numbered bottles of urine on which he makes his little tests. Consultations should be held at which the general outlines and progress of investigation should be discussed and opportunity afforded for the examination of any particular case necessitating a biochemical interpretation or study.

Complete independence should be allowed the biochemist in the outlining of his methods of procedure and the problems for investigation, always, however, seeking assistance and ready to give help when his specialized training fits him to be of service. His administrative duties should be confined to his own lines of activity and general laboratory supervision or directorship since it is in that field his capabilities have been developed. The instruction of nurses in the principles of physiological chemistry by the biochemist should be encouraged since the proper collection of specimens depends upon their intelligence. They can not be expected to have an appreciation of the precautions necessary in

collecting the material if they are set to do it as automatons and with no knowledge of the purposes involved.

In these days of ours the question of compensation is extraordinarily vital. The scientific specialist is such because he can not help it. His mental make-up forces him to spend his life in giving, not in getting. He is rarely a success in self-directed commercial enterprise. He has no inclination to enter such work unless driven by necessity, and then it is with repugnance, that he competes with his fellow-men in the accumulation of dollars. Rather does he live a life largely deprived of the creature comforts accorded those mentalities whose urge is acquisitional. But whose is the greater service is obvious. Why should not such workers be given compensation sufficient to allow them to have homes and more than bare necessities? Why should they be forced to derive their major *joie de vivre* in intellectual introspection? Is it because the work is of low value or is it because of sluggish appreciation and lack of self-advertising? Whatever the causes it is not right, but no matter how wrong it is we have men, and will continue to have men who will gladly devote themselves to science whatever the compensation. Nevertheless measures should be taken by properly organized associations, to so educate those necessary of education that future generations of scientists, if not this one, may receive an adequate income in recognition of their continued contributions to human welfare.

FREDERICK S. HAMMETT

PENNSYLVANIA HOSPITAL,
PHILADELPHIA

CHARLES BUCKMAN GORING

FEW of the readers of *SCIENCE* will be familiar with even the name of Charles Goring.¹ His time was largely spent as a

¹ Goring was born in 1870 and died in 1919. He was a student and later a fellow of University College, London. He served on a hospital ship during the Boer War. At the time of his death—met at his post combating the influenza epidemic—he was Medical Officer in Chief at Strangeways