and ruthless exposition of the teacher's shortcomings—an exposition which in other subjects is neither so glaring nor usually so disastrous. The teacher of mathematics must be a logical reasoner and ready in manipulation. If his training has left him without these powers, his other mental powers will avail him nothing. Either the pupil is right or he is wrong. Neither teacher nor pupil can escape the consequences of false reasoning or lack of skill in handling mathematical expressions. So, too, the glimpse the teacher gets of fields unexplored, which he vaguely realizes must have an influence on the interpretation of the work on which he is engaged, is a constant intimation of inadequacy, and so a source of self-accusation that heightens the acute "misery of conscious weakness" which he is sure to feel, and which is one of the most paralyzing of all the untoward influences that oppress the conscientious but meagrely equipped teacher. There is no heavier burden than the burden of accepted duties that one feels he cannot adequately perform.

There is, of course, always hope for the able teacher inadequately prepared, for he may, by dint of hard work, ultimately achieve at least a moderate efficiency, although at the expense of many pupils; but there is no hope for the ignorant teacher of poor ability unconscious of his own ignorance. In either case the want of adequate preparation before actual service begins casts its shadow over his entire professional career.

To teach mathematics well in the high school, it is, therefore, hardly necessary to argue that one must have a thorough knowledge of the subject, a knowledge that is far in advance of pre-collegiate study, *i.e.*, far in advance of a good acquaintance with the branches of mathematics usually found in the high school curriculum or such a presentation of them as is contained in the usual text-books. It is hardly necessary to argue that with an equipment limited to pre-collegiate study, the teacher of elementary mathematics is unable to comprehend the relative importance of the different phases of his subject. He may, and usually does, neglect important aspects and magnifies trifles. He treats facts and processes as ultimate ends in themselves, instead of means to ends. He never gets the comprehensive point of view from which the subject is unified and gains full significance in his own and the pupils' minds. His pupils not infrequently learn many things which subsequently must be unlearned—an expensive and exasperating experience. That he may escape this unfortunate situation, that he may from the start enter on his work well equipped for the demands that are to be made on him, I purpose now to enquire what should a good course of study, to be pursued by the high school teacher of mathematics as special preparation for his work, comprise?

Bearing in mind that this course of study should enable the teacher to appreciate the relative importance of the different phases of his subject and of their interdependence throughout, and so enable him to select with certainty and wisdom those portions of mathematics essential to the elements of a liberal education, or for future specialization in mathematics, if the pupil's interest and probable career should lead him into that field; and also that the teacher should know and be able to point out the significance of mathematics for the adequate development of power over other sciences, it is clear that the teacher's preparation must cover both pure and applied mathematics, and a general training in elementary physical science. Only through such knowledge is it possible to expect confidently that the teacher shall have an adequate, a wise,