

that have been fixed in alcoholic formalin. Hence staining is not limited to the cytoplasmic granules of the mast cells. Because of the low pH of the dye solution, however, the dye binds with only the most strongly acidic tissue components, principally the sulfonated mucopolysaccharides. The only material in the tissues we have examined other than the mast cell granules, which is deeply stained, is cartilage matrix. In some organs that have a very high content of cytoplasmic ribonucleic acid or that have numerous dense nuclei, weak staining with the toluidine blue may occur. Because there is little likelihood of confusion, the method can be considered, for practical purposes, to be highly selective for mast cells. It should also be noted that an acid dye is used as a counterstain only as a matter of convenience to facilitate the identification of the various tissues and organs on the slides.

The staining schedule given was deliberately designed to overstain the mast cells in order to obtain the greatest contrast with the surrounding tissues, and thus to make counting easier. If desired, greater cytologic detail can be obtained simply by shortening the period of staining in step 3. In order to make cell counts rapidly, the low-power objective lens may be used. To prevent confusion and in the interests of accuracy, however, scrupulous cleanliness must be observed during the preparation of the slides, especially in preventing the accumulation of dust particles on newly mounted sections during drying of the slides.

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References and Notes

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3. This investigation has been supported by a research grant (C-2503) from the National Cancer Institute, National Institutes of Health, U.S. Public Health Service.

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Role of Teachers in Scholarship Programs

As a local committee, concerned with improving science teaching in the secondary schools as one means of alleviating the present critical shortage of scientists and engineers, we feel that one aspect of our findings should be brought to the attention of *Science* readers. A complaint frequently voiced by high-school science teachers concerns the burden of

noninstructional duties they are expected to bear. In addition to the records and forms required by various local, state, and federal agencies, these teachers receive a multitude of questionnaires, data sheets, and various other types of requests for information from many public and private organizations. It seems unfortunate, to say the least, that many of the requests come from well-intentioned groups that are working toward improvement of our educational system.

The citation of a single example will, perhaps, serve to emphasize our point. The National Merit Scholarship Corporation, financed by grants from foundations and industry, recently initiated the largest nongovernmental scholarship program in the history of American education. In this program, about 60,000 seniors, selected from 10,000 high schools, were given a 3-hour competitive examination, after which 4000 students were selected as semifinalists and given the scholastic aptitude test of the College Entrance Examination Board. The 2000 scoring highest in the latter test will become finalists, and from this group approximately 400 will be awarded scholarships ranging from \$100 to \$2000 based on need. If the average cost of a 4-year scholarship including a "cost of education" grant to the college is \$6000 [*Science* 122, 508 (1955)], then the annual total value of the 400 scholarships would be \$600,000. Such a contribution is truly impressive and, at first glance, seems richly rewarding for all concerned. Superior students receive recognition and financial aid, colleges fortunate enough to be selected by these superior students likewise receive recognition as well as financial assistance, while the donors receive favorable publicity not only in connection with the national interest aroused by the program but also through donor-identity which is maintained with all scholarships.

One group, however, seems to have been completely overlooked. The high-school principals and teachers who were "invited" to participate in the program undoubtedly should receive recognition for stimulating and training the superior students who are selected for scholarships. Even if this is denied on the argument that the teachers are merely carrying out their regular duties, they should, at least, receive credit for the role they play in the scholarship program. On the basis of experience in local high schools, we have attempted to calculate the number of man-hours that principals and teachers must contribute in order to participate effectively. We estimate that completion of entry forms, conferences, and record checking to select the most promising students and administration of the first screening examina-

tion required 6 hours for each of the 60,000 examinees, or a total of 360,000 man-hours. The time required to compile and submit the information required for the 4000 semifinalists and 2000 finalists is difficult to estimate but would probably bring the total close to a half-million man-hours. Assuming that the teachers' time is worth at least \$1 per hour, their contribution would be nearly equal to the total value of the scholarships. Even if these estimates, which are admittedly rough, were reduced by half, the teachers' contribution would still be tremendous.

We wish to make it clear that this statement is not intended as a specific criticism of the National Merit Scholarship Program. All of the high-school principals and teachers contacted felt that the program was well worth the time required for participation. Several pointed out that less valuable programs of various types made more excessive demands on their time. We hope that the example cited may encourage administrators of such programs to examine their procedures with the view of reducing to a minimum the demands placed on secondary-school personnel. In the case cited, we should also like to suggest that some concrete form of recognition be awarded to those high schools that have scholarship winners. This might be done by awards to the teacher or teachers that the winners designate as most responsible for their success, or, if such a plan is not feasible, an unrestricted award to the school for the purpose of improving teaching might be made. We believe that such awards would serve to draw public attention to the important contributions made by the secondary-school teachers.

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Infectivity of Tularemia Applied to Intact Skin and Ingested in Drinking Water

In his book on tularemia, Simpson described in the following words Francis' demonstration of the penetration by *Bacterium tularensis* (*Pasteurella tularensis*) of the unbroken skin: "Francis dropped onto the unbroken skin of normal guinea pigs, suspensions of splenic tissue of guinea pigs recently dead of tularemia; the guinea pigs were dead in five days; at autopsy they showed the