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**TRANSISTORS IN VACUUM—**  
*Tiny transistors used extensively in satellites, such as Telstar, are placed in vacuum jar to prevent moisture or contamination from reaching them. Mrs. Mae Astl, Western Electric Company, Allentown, Pa., examines transistors prior to final assembly.*

Creative research calls for a combination of qualities only one of which is superior intelligence. It is difficult to specify the combination of characteristics which may be of crucial importance for success in solving a specified scientific problem. Perhaps an intuition or a "feel" derived from lengthy experience with certain types of phenomena, perhaps special knowledge of a new instrumental technique, perhaps a natural manual dexterity in some important type of laboratory manipulation, perhaps an unreasonable stubbornness in seeking a better explanation of some phenomena which others have passed by as "explained" may be the key to a fruitful series of developments.

I should find it difficult to explain the secret of the effectiveness of the many able scientists I know or the relative ineffectiveness of others who seemed to hold out great promise. Maybe it's just plain hard work, because, without downright hard work, there can be no success in a scientific career. All the productive scientists have been "smart," it is true, but the ways in which they have been "smart" have differed greatly. And, as I have said, they are all dedicated hard workers.

In the near future we shall hope to see a great expansion in our colleges and universities including our graduate schools of science and engineering.

We should see an expansion of research activities adjacent to university campuses and in university-related institutes as the importance of our scientific education and research to our national growth is fully realized. We should also see a more vigorous and understanding support of uncom-

mitted research in industrial and governmental as well as university laboratories, with the realization that such research over a period of years will result in faster discovery of radically new developments.

Today, new discoveries in the nature of matter, the structure and the electrical and magnetic properties of materials, etc., are rapidly reduced to engineering application. To carry out this reduction rapidly and surely the engineer must have a sound and sophisticated knowledge of science and an adaptability which in general will be achieved only under a thoroughly revised engineering curriculum including some graduate training.

In the education of the nonscientist there is a necessity of including a course or courses that will insure a better understanding of science as part of the general high school and college or university undergraduate curriculum.

We live in an age in which, for better or worse, the influence of science is pervasive and revolutionary. It is a part of our culture which is shaping nearly every aspect of our lives and our institutions. We can no more ignore it than the man of the middle ages could ignore the Christian church or the feudal system.

Properly nurtured and employed, science can provide us with marvelous tools for the solution of many of the weighty problems of our physical and social world. The promise of the future lies in the hands of the dedicated and the educated. A most significant part of that promise lies in the field of science. I would invite the earnest young men and women who are prepared to study and work hard to join in the exciting and rewarding profession of science and the scientist.

• Science News Letter, 83:314 May 18, 1963

SPACE

**Russia and U.S. Plan Meeting on Space Probes**

➤ RUSSIAN EXPERTS who worked on a rocket heading for Mars and the U.S. scientists who worked on the recent Venus probe are planning to meet together early next month to trade data and conclusions.

The exchange is being arranged in the interest of spreading basic scientific knowledge. Plans are to hold the meetings in Warsaw along with sessions of COSPAR, an international group to coordinate space research.

The Russian spacecraft, launched Nov. 1, is scheduled to reach Mars around June 19. The United States' Mariner II, launched last Aug. 27, passed within 22,000 miles of Venus on Dec. 14, sending back information about the "solar wind" and magnetic field there.

U.S. and Russian scientists also plan to join hands in a study of information about the earth's magnetic field as revealed in satellite readings. Those meetings will be in Geneva along with the technical subcommittee of the U.N. Committee on Peaceful Use of Outer Space.

• Science News Letter, 83:317 May 18, 1963

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