

The two products illustrated presented the same problem—how to carry rotary movement around a turn. The designers might have done it with combinations of straight shafts, universals, bevel gears and other mechanical elements. Instead, they saved parts and costs by using S.S.White Flexible Shafts, and they eliminated a lot of unnecessary assembly time and operations in the bargain.

Many of the problems you'll face in industry will deal with the application of power drives and remote control with cost being an essential factor. That's why it will pay you to become familiar with S.S.White Flexible Shafts, because these "Metal Muscles" offer important savings in transmitting power or control.

#### SEND FOR THIS FREE FLEXIBLE SHAFT BOOKLET

Bulletin 5008 contains basic flexible shaft facts and shows how to select and apply flexible shafts. Write for a copy.





#### **ALUMNI NEWS**



Dr. Weir checks returns in the Caltech alumni survey.

### THE ALUMNI SURVEY

By JOHN R. WEIR

CALTECH HAS NEVER made a comprehensive alumni survey. A number of departments at the Institute have expressed a desire to have one made, but somehow no one had the time or inclination to take on the job.

When I came here last year as Associate in Psychology, this was suggested to me. There were three major reasons for wanting to conduct such a survey:

- 1. To verify our assumptions concerning the status, the activities and the functions of the alumnus after he has left school. These assumptions, of course, are used in setting up academic courses and procedures and, in general, in defining the total functions and objectives in the administration of the Institute. If these assumptions are not valid, as revealed by the results of the alumni survey, then it is assumed that they will be brought into line with these results.
- 2. To identify how and in what ways the Caltech alumnus is similar to and different from college graduates in general—this to be done by comparing the proportions of responses to the various items from the Caltech group with college graduates in general as given in the book, They Went to College (which you'll find described a little later in this article).
- 3. To evaluate the relationships between the non-academic student activities and the alumnus' accomplishments and needs which arise in his later life—in other words, to determine the extent to which non-

CONTINUED ON PAGE 46



# U.S. VARIDRIVE

### DEVELOPS EXTRA MACHINE OUTPUT YOU NEVER DREAMED POSSIBLE

Automobiles go modern with automatic transmissions. Production machines go modern with U. S. Varidrive—the miracle motor. It changes to any selected speed instantly. The Varidrive can run in unison with the rhythm of the operator. It will increase your workers' abilities and quality of product. It can be run slow or fast or at any in-between speed, right to a split rpm. Machines that "loaf on the job" can be stepped up to unlock their surplus capacity. You don't have to change gears, shift belts or use a rheostat. Just turn a control dial. The U.S. Varidrive Motor is self-contained, all on one base, embodying a motor with a built-in speed control. By increasing machine output, the Varidrive repays its cost within a few weeks or months. Install Varidrives for greater profit.

U.S. ELECTRICAL MOTORS Inc.
Los Angeles 54, Calif. Milford, Conn.

### U.S. MOTORS

UNICLOSED, VARIDRIVE, SYNCROGEAR & TOTALLY-ENCLOSED TYPES

#### ALUMNI SURVEY . . . CONTINUED

academic activities correlate with success, happiness, and satisfaction in later life.

Three institute offices were primarily concerned about having an alumni survey made—the Office of the President, the Admissions Office, and the Alumni Office. Since I was very much interested in conducting such a survey, I began to work up items for a questionnaire and to plan the design of the project. While I was in the course of doing this, the book, They Went to College (E&S—April 1952), was published.

They Went to College began as a reader survey for Time Magazine in 1947. It is based on a questionnaire sent out to college graduates (from the class of 1884 down to the class of 1947), which brought replies from 9,064 graduates of 1,000 colleges.

After some discussion of the relative merits of the *Time* survey, it was decided that, for several reasons, the Institute might use this same questionnaire for its survey.

#### Why this questionnaire?

There were several reasons for this decision:

- 1. Similar data collected from a Caltech alumni group would permit comparisons with the group studied in the book—this group being a random cross-section of American college graduates. This was an unusual opportunity. Comparisons of this sort are not ordinarily available, and there is always the question of interpretation of questionnaire results when there is not a second population to compare them with.
- 2. The questionnaire was very well planned. It had been worked out by a group of experts in this field, and was designed to permit filling out and coding with a minimum of effort.
- 3. There would be a considerable saving in money, since the questionnaire was already made up, and would not have to be constructed from scratch.
- 4. The procedure would save considerable time, for it would take a year or two to develop such a questionnaire as this one. We could obtain the questionnaire, mail it out immediately, and thus actually accomplish the alumni survey in a matter of one year rather than several.

As to the questionnaire itself: it is obviously the product of a considerable amount of thought and effort. It is organized in such a way as to permit easy coding and to require a minimum of effort on the part of the person filling it out. It also collects a broad range of basic or fundamental data and permits countless numbers of cross comparisons within the various groups.

Still, it is not exactly what we would have used had we developed our own. Some items obviously do not apply to Caltech alumni. Others are items which we feel are not truly important. However, a major num-

CONTINUED ON PAGE 48

#### ALUMNI SURVEY . . . CONTINUED

ber of items in the questionnaire are of extreme value and interest to us, and we feel that this questionnaire essentially accomplishes the purpose we had in mind.

Questionnaires were mailed to all Caltech alumni in the latter part of July of this year. They went to all graduate, undergraduate, and foreign alumni. Every effort has been made to keep the questionnaire returns completely confidential. The alumnus' name was on the questionnaire when it was mailed out, but this was done solely to permit a follow-up letter to be sent to those alumni who did not return the questionnaire within 30 days of the date of the initial mailing.

When the questionnaire is returned, the name of the alumnus on the back of the questionnaire is obliterated; thus, there is no way in which an individual questionnaire can be identified. The questionnaire data are considered to be entirely confidential and are not seen by any one on the campus except myself and my assistant.

The results to date have been very gratifying. There were 5,640 questionnaires mailed out the latter part of July. Up to the middle of October, 3,609 had been returned as completed. This represents approximately 64 percent of the original sample. Returns are con-

tinuing to come in—up to a dozen a week—and I expect that we will end up with somewhere around 67 to 70 percent. This is an excellent return. The *Time* questionnaire survey got only 55.6 percent return, in spite of the use of several additional procedures which we do not contemplate using.

Alumni who have not as yet completed their questionnaires are encouraged to do so. There is no deadline for their return. In addition, if any alumnus has not completed and returned a questionnaire and wishes another one—having lost his initial one—he can write to either Engineering and Science or to me and another copy will be sent immediately.

The job now is one of coding the items of the questionnaire, punching them into IBM cards, and tabulating the results. All results will be reported in terms of percentages of the total group. This is the same method used in the *They Went to College* study.

It took *Time* Magazine four years from the mailing of the questionnaires to the publishing of the book, and involved approximately 9,000 questionnaires. We have, in our survey, approximately 3,700 questionnaires and have high hopes of completing the work in about a year. The present plan is to publish the results in *Engineering and Science*, in several separate reports, each report covering certain related aspects of the data collected in the questionnaire.

## **GOOD LIGHTING**

..as important as your most important tool

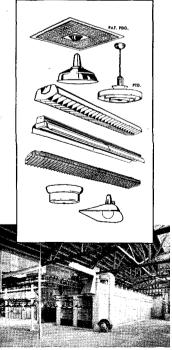


Engineers...draftsmen...designers... all know the slide rule is an all-important "tool;" but certainly no more efficient than their ability to make full use of it. Don't invite eye-fatigue and impair job performance with poor illumination.

Smoot-Holman lighting equipment can solve this problem—as it has for thousands of workers in other western plants. Made to exacting quality standards, it provides illumination always ample, always correct for the eyes—light that's a perfect partner for production.

Equally important, there is a Smoot-Holman fixture to match any job's specific need! See your Smoot-Holman Lighting Engineer!





All-important "tools" help assure Smoot-Holman production and quality, too. This modern porcelain enameling furnace fires on permanent "litatime" finites at 180% (througheit

SMOOT-HOLMAN COMPANY Inglewood, Calif Offices in Principal Western Cities - Branch and Warehouse in San Francisco

#### SIT BACK AND RELAX



#### Let Calmec Manufacturing Company Worry About Your Metal Parts and Products

We have the most modern facilities and most complete plant to give you the maximum of service, whether it is a small part, a large part, or a product from your ideas to the shipped article direct to your customers, under your name, from our plant.

#### CALMEC MANUFACTURING CO.

Robert A. McIntyre, M.S. '38 KImball 6204 5825 District Blvd. Los Angeles 22, Calif.