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PRESENT STATUS OF THE APPRENTICESHIP SYSTEM.

Since the date of our last reference to the apprenticeship system of the United States, the question has experienced one of its periodical revivals, and its pros and cons have received a very thorough discussion. The technical press, almost without exception, has opened its columns for correspondence and given the matter extensive editorial notice. It has also formed the subject of debate in trades unions, labor societies and the conventions of master workmen, and furthermore, it has lately been made the subject of carefully detailed report after examination by a committee specially appointed for the work.

After carefully following the discussion and gleaning the actual facts, as they have appeared from time to time, one is carried to the conclusion that the apprenticeship system is not so generally moribund as the state of affairs in some particular districts and trades would lead one to infer. This conclusion is borne out by the effort recently made by a committee of the Master Mechanics' Association to ascertain by circular letter the present status of apprenticeship in the railroad shops and in those devoted to the manufacture of machinery. The committee received over three hundred replies, which indicate that in some form or other all the leading railroads maintain a modified form of apprenticeship. Some of them go so far as to require the signing of articles binding the apprentice for a number of years, while others are in the habit of taking on boys at a small remuneration, the understanding to exist so long as it is mutually acceptable.

In general, it would seem that the arrangement which is most in favor in the United States is similar to that which was communicated to us by the Brown & Sharpe Manufacturing Company, of Providence, R. I., and commented upon editorially at the time. This, as our readers may remember, consists in giving the boys a probationary trial before they are bound by any articles, in order to determine whether they have any natural aptitude for the trade; and then binding them in an apprenticeship of three years' duration, in which the firm, in consideration of one hundred dollars, pledges itself to instruct the apprentice in the machinist's art and trade. If the boy complies with the provisions of the contract for the time specified, the one hundred dollars is returned; he is also paid at the rate of four cents an hour for the first year, seven cents for the second, and ten cents for the third year.

This plan, which we think is, on the whole, as good as any that have recently come under our notice, may be taken as fairly representative of American practice to-day. The chief modification has been in the direction of strengthening the inducement for the apprentice to serve the full time of his contract. This is being done in some cases by withholding a small percentage of his wages, instead of requiring a cash deposit in advance. The advantage of the former method is obvious, for, whereas the forfeiture of the deposit would probably affect only the boy's parents or guardians, the loss of his wages would tell upon his own pocket, and, as boys generally go, would be a proportionately stronger deterrent.

In all the discussion, verbal or written, of the past few months there are two encouraging facts which are clearly established and are full of promise for the future of the apprenticeship system. In the first place it is clearly recognized that while the root idea of the old apprenticeship was good, the system must be entirely revised in order to adjust itself to modern conditions, both mechanical and social. This is self-evident. Specialization in the machine shop on the one hand, and broader, more liberal views of the relation of master and man on the other, have rendered the seven years' "service" of the "bound" apprentice of former years neither desirable nor possible. We may regret the passing of the all round ability of the finished machinist of other days; but gone it is, and for the good reason that there is no call for such superfluous versatility. The modern methods of shop and factory management call for superior excellence in special lines of work, and the result has been that the length of the term of apprenticeship has been cut down fully one-half. At the same time the relations between employer and employed have been made more elastic, and they conform more fully to modern ideas. Moreover, the earning of a small wage has given a certain independence to a position in which the occupant was formerly too often treated with scant regard, if not with positive indignity.

The other fact in which we find much promise for the future is that, after carefully going through most of what has been said or written on this vital question since we last had it under review, and as the result of our own independent inquiries, it is abundantly evident that the modified form of apprenticeship which is now in vogue is a practical success.

As regards the trade and night schools and their relation to the system, we think, as before, that their work should be considered as both preparatory and supplementary to apprenticeship. If the tendency of modern apprenticeship is toward a too rigid specialization, the trade school will act as an effective corrective, giving

the boys an opportunity to acquire knowledge, if not dexterity, in lines of work to which they do not have access in the shops.

A NATIONAL DEPARTMENT OF SCIENCE.

In a few days a formal recommendation will be submitted to Congress in favor of the establishment of one great scientific department of science in place of the several existing separate government bureaus, which are maintained at great expense for the promotion of science and the development of the resources of the country. Charles W. Dabney, Jr., Assistant Secretary of Agriculture, has prepared an argument favoring the consolidation of all the bureaus into one department. He shows that, aside from the government schools and the testing laboratories of the War and Navy Departments, the United States maintains no less than twenty-eight scientific bureaus for the development and advancement of industrial resources. These bureaus employ over 5,000 persons and are maintained at an expense of \$8,000,000. As all of the bureaus have a common purpose, and considerable money and time is wasted by the duplication of work, it is urged that they be placed under the direction of a single head. The statistical records of the national resources and products of the country are collected and kept by eight different agencies connected with six different government department bureaus, not counting the Census Bureau. The proposal which is to be submitted to Congress is to consolidate all the statistical bureaus and establish a permanent census, which shall do in a systematic way what is now done once in ten years at great expense. Congress will be asked to decide upon the general programme, and as opportunity offers, transfer the different bureaus to some one of the departments.

THE HEAVENS FOR FEBRUARY.

BY WILLIAM R. BROOKS, M.A., F.R.A.S.

THE SUN.

On the first day of February there will be an annular eclipse of the sun. It will be visible as a partial eclipse in the United States, and as such only south of a line drawn from Boston in a southwesterly direction through the Middle and Southern States to the southern point of lower California. To all places north of this line the eclipse will not be visible. In the vicinity of the Atlantic coast from Charleston to Boston a small phase of the eclipse will be visible shortly before sunset. The path of annulus, from thirty-five to forty miles in width, extends from a point about 10 deg. east of the northeastern coast of Australia, across the South Pacific Ocean and the northern part of South America, ending on the northeastern coast of the last named country.

Along this path the moon will appear to pass centrally across the disk of the sun; but the relative distances of these two bodies from the earth are such at the period of this eclipse that the moon does not quite hide the entire face of the sun. At the moment of greatest obscuration there will be seen a narrow ring of sunlight surrounding the moon on all sides. Hence the designation annular eclipse.

An enormous sunspot has been visible on the sun's face during January, and it is quite likely to appear by rotation early in February, although it may be very much changed in both size and form. During its passage in January this spot was easily visible to the naked eye through a smoked glass. In the telescope it was, indeed, a fine object. The apparition of this great disturbance is remarkable, coming as it does at what is regarded as the minimum stage of the sunspot periodicity. All having telescopes properly arranged for solar observation should keep a watch on the sun at the present time.

The sun's right ascension on February 1 is 21 h. 2 m. 33 s.; and its declination south, 16 deg. 52 m. 33 s. On the last day of the month its right ascension is 22 h. 47 m. 41 s.; declination south 7 deg. 39 m. 56 s.

MERCURY.

Mercury is morning star, reaching its greatest elongation west of the sun, 26 deg. 23 m., on January 15. This will be the best time to look for Mercury as morning star, although its southern declination is unfavorable. The position of Mercury at that time will be, right ascension 20 h. 16 m. 30 s.; declination south 19 deg. 35 m. 16 s.

Mercury is stationary on the second, and in aphelion on the twenty-seventh day of the month.

VENUS.

Venus is evening star, and shines with regal splendor in the southwestern sky long after sunset. It reaches its greatest elongation, 46 deg. 39 m. east of the sun, on February 16.

Venus is in conjunction with the moon on the fifth of the month at 5 h. 43 m. in the afternoon, when Venus will be 3 deg. 48 m. south of the moon. This will form a most enchanting celestial picture, the moon being in the crescent phase at that time.

On the first day of the month Venus crosses the meridian at 3 h. 8 m. in the afternoon and sets at 9 h. 10 m.