The first move, however, consists of inaugurating a special canvass of the workers for original, practical ideas tending toward the development and improvement of each man's job. The proposals accumulated in this way are then examined by management, either in the planning office or, preferably, by a special joint committee representative of workers and management. Results from this opening canvass are then used as economic justification for a more regular and systematic canvass through a permanent joint committee. In the plants that I have referred to, the worker, when he thinks up some minor improvement in his job, feels perfectly free to suggest it to his department foreman. If, in the foreman's judgment, the idea is a good one and its adoption practicable, he has power to approve the change. Where the worker considers his proposal an important one, meriting higher and more private consideration, or where the foreman knows that ultimate approval must come from a more responsible authority, the suggestion is submitted to the joint committee. For a number of years now, I have recorded the details of outstanding proposals coming from workers in these plants and my collection of cases now amounts to a great number. I am submitting the best twenty-five of these to the Taylor Society, and if any of my audience is of the opinion that the potential creative contribution of workers to industry in this machine age is unimportant, I can only suggest that he scrutinize these cases with care.

Labor's most pressing problem unquestionably is that of organizing the great residue of unorganized workers throughout industry. While I know that organizing activity must of necessity employ a shifting strategy and is thus, in its nature, opportunistic, I cannot escape a conviction that labor organizers would be greatly assisted by a methodology similar to the scientific management approach. A scientific record of different kinds of organization activity with their results, a fact finding survey of unorganized territory along scientific lines, and the utilization of modern graphical methods for the representation and analysis of these facts, all would seem to possess positive utility in furthering organization campaigns. I had fleeting evidence, about a year ago, that some progress already has been made in this direction. While sitting in the outer office, awaiting an interview with an A. F. of L. state organizer, I noticed hanging on the wall opposite me two large Gantt wall charts. I was about to step across and examine them surreptitiously, when the door suddenly opened and I was summoned inside for my conference. I have never discovered just what facts they were visualizing. In any event, there is little doubt in my mind that the scientific compilation and representation of facts and figures relating to organization activities, as well as other major activities of labor, can be of great assistance to trade union officers and to the labor movement as a whole.

What specific gains will accrue to labor through development and exercise of the new critical function that this paper proposes? The proposal involves a considerable appropriation and expenditure of trade union funds, and its pragmatic soundness from labor's standpoint must be clear before the unions can be expected to regard it with much seriousness. These gains, as I see them, fall into five categories. *First,* there will be an economic gain through the impetus that will be given to progressive waste elimination throughout industry. The ill effects of wasteful management bear heavily on the worker in his dual capacities as wage earner and consumer. *Second,* labor will gain an adequate instrument through which to cope with abuses in modern management practice. The science of management is spreading throughout America and Europe. Abuse of its principles by unscrupulous employers and managers, to the disadvantage of labor, undoubtedly will occur. Labor must be prepared to meet such abuse on its own ground. *Third,* there will be a moral gain through increased prestige that will accrue to organized labor in its warfare on an obvious social evil. Modern civilization is at war with waste. The unions, therefore, by taking the initiative in this crusade, must gain in time the support of thoughtful people everywhere. *Fourth,* by employing engineers in the proposed departments wherever necessary, labor will gain a new affiliation with the engineering profession. With industry and management on their present technological level the labor movement needs the engineer. I might add, as one conversant with the economic conditions of the average member of my profession, that the engineer needs the labor movement. The *fifth* and last, and, to my mind, most important gain is one that embraces the preceding four and provides the final argument in favor of more extensive participation by labor in the management of industry. *Labor will gain greatly in power by such participation.* Accumulation of social power must needs be the great objective of organized labor at its present stage of progress. Greater social power can come only by bringing into active union membership, unorganized non-union workers wherever they are to be found, and by an increased constructive utility of the trade union in its relation to society as a whole. This increased utility can be gained only by a correct interpretation and utilization of tendencies in an industrial world that has passed through a great mechanical and technological revolution. Handicraft industry has gone. It has been vanishing slowly from occidental gaze for a century or more. The ideology that grew up and flourished around handicraft has survived on into our world, but now it too is rapidly passing. Labor faces a new industrial set-up. It cannot afford to lag behind while industry presses ahead. Should it do so, presently it will lose power and dwindle away in an unfamiliar world. The new function that I have proposed is designed to provide a safeguard against any such eventuality, and to establish the nucleus of an organization feature by virtue of which labor can maintain and increase its social power in the industrial world of today and of tomorrow.

Workers Participation in Creative Production
Twenty-five Selected Cases

Case 15—J. C. Olsen. Metal working plant, December 1921. A hand screw operator suggested that piston pins be machined from seamless steel tubing instead of solid bar stock. Existing practice consisted of drilling and reaming a solid steel bar of one and a half inch diameter. By the use of steel tubing, drilling and reaming times on each piston obviously were much reduced. The standard time to finish single piece was reduced from 24.0 minutes to 10.3 minutes by this development.

Case 16—L. Curtis. Metal working plant, January 1922. Pratt and Whitney turret lathe operator suggested that bronze valve guides be machined from bar stock instead of from individual detailed castings. By the existing method, these valve guides were cast separately, and then machined to the proper dimensions on a turret lathe. By using bar stock the molding operation on individual pieces was done away with and a great saving effected in the manufacturing cost of these parts.

Case 17—J. De Young. Metal working plant, September 1923. Store room attendant wrote to the management suggesting that materials, parts and subassemblies be placed in bins having a convenient numerical sequence, and that assembly order sheets be made out in a similar numerical sequence. By issuing assembly sheets in a certain numerical order and arranging storage bins in corresponding numerical order, much time and labor would be saved in stock rooms as the store keeper, after a quick glance at an assembly sheet, would know at once just what aisle, tier and bin to go to for any stipulated material or part. This worker embodied in his memorandum a comprehensive scheme of symbols and numbers to support his idea. The general scheme was approved by the management and adopted.

Case 20—A. Kufta. Metal working plant, December 1927. Warner and Swasey hand screw machine operator suggested and developed a forming tool for use in producing steel valve guides at his machine. This tool, mounted on the back cross-slide, accomplished the work formerly done by five separate tools in the turret, viz., two turning tools, an undercutting tool, a facing tool, and a chamfering tool. The productivity of the operation was more than doubled by this development.

Case 9—J. Huber. Metal working plant, October 1928. Milling machine operator developed a milling vise by means of which seventeen bars of key stock could be held in close parallel and seventeen keys cut off simultaneously. These keys formerly had been cut off singly. An increase in output of about 600 per cent followed this change.

Case 11—W. Wyring. Wire and Cable Company, Yonkers, November 1920. Gang boss in wire stranding department developed a way of overcoming frequent breaks in wires during the stranding operation. These breaks, each of which necessitated a stoppage of the large stranding machine until the broken ends could be brazed, long had been a source of heavy expense and annoyance to the management. Individual wires, sometimes to the number of several hundred, depending on the size of the cable, passed through guide holes arranged in concentric circles about the surface of a steel disc, and then angled down to the strander die. This worker observed, one day, that the outer circle of wires bore heavily against the inner edge of the guide hole, this contact with a relatively sharp surface, combined with the tension on the wire, probably cutting the latter while stranding was in progress. He removed the stranding disc, took it to the machine shop, and had the concentric holes moved nearer to the center of the disc, thus lessening the angle of tension on the outer circle of wires. This solved the problem, the delays through wire breaks being virtually eliminated. The saving was very great. The worker responsible for it, so far as I know, received no kind of recognition for his achievement.

Case 28—H. Wankling. Metal working plant, February 1928. Set-up man was given an operation instruction sheet stipulating that the operation of chamfering a certain type of steel washer be performed on a No. 2 Warner and Swasey hand screw machine. This necessitated placing each washer in a special chuck, using a chamfering tool in the turret, and moving the turret to the work while machining each piece. The set-up man suggested that the job be transferred to a simple speed lathe where the chamfering tool, mounted in the head of the machine, could run continuously, the washers being held against it, one by one, by the machine operator. This change eliminated the time spent in stopping and starting the machine between pieces, as well as the time consumed in advancing and withdrawing the turret by the former method. The standard time to chamfer this kind of washer was reduced from .75 minutes to .25 minutes, equivalent to an increase in output of 200 per cent through this development.

Case 29—W. Tokars. Metal working plant, February 1928. Operator worked on a Leland and Gifford four spindle drill press, drilling carburetor wrenches. The operation instruction furnished by the production office stipulated that each piece must be laid out by the drill press operator, the points for each of four holes spaced at right angles on four sides of the piece, being located with a scale and spotted with a center punch. The drill press operator found this method too slow and laborious, so he thought out a better one. Procuring a drilling vise from the tool crib, he used it as a locating fixture, placing two steel blocks in the vise as stops to hold the work in proper alignment. By the use of this fixture the necessity for laying out each piece was eliminated, and the standard time for the operation reduced from 8.6 to 3.5 minutes.

Case 30—Otto Kern. Metal working plant, February 1928. Operator, machining bronze bushings on a No. 6 Warner and Swasey hand screw machine, had been instructed to use a facing and cutting off tool on opposite sides of his cross-slide; and a spotting tool, a drill, a reamer, a roller turner and a chamfering tool in his turret. On his own initiative, this operator developed two combination tools. The first, a