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INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS — AFL-CIO

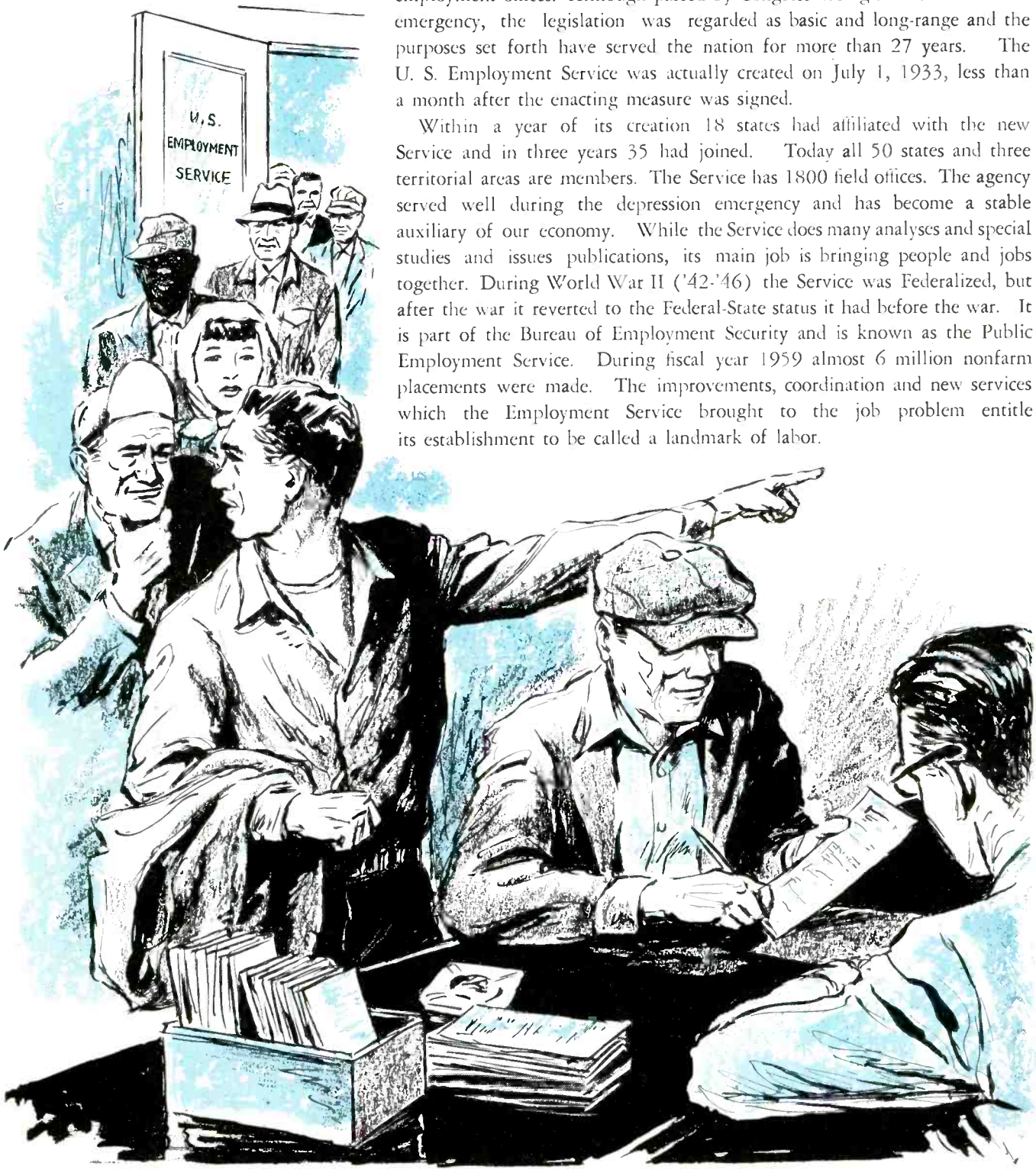
ESTABLISHMENT OF THE UNITED STATES EMPLOYMENT SERVICE

June 6, 1933

". . . to promote and develop a national system of employment offices . . ."

These words state the basic purpose of the Wagner-Peyser Act signed June 6, 1933 establishing a nationwide system of affiliated Federal-State employment offices. Although passed by Congress during a time of economic emergency, the legislation was regarded as basic and long-range and the purposes set forth have served the nation for more than 27 years. The U. S. Employment Service was actually created on July 1, 1933, less than a month after the enacting measure was signed.

Within a year of its creation 18 states had affiliated with the new Service and in three years 35 had joined. Today all 50 states and three territorial areas are members. The Service has 1800 field offices. The agency served well during the depression emergency and has become a stable auxiliary of our economy. While the Service does many analyses and special studies and issues publications, its main job is bringing people and jobs together. During World War II ('42-'46) the Service was Federalized, but after the war it reverted to the Federal-State status it had before the war. It is part of the Bureau of Employment Security and is known as the Public Employment Service. During fiscal year 1959 almost 6 million nonfarm placements were made. The improvements, coordination and new services which the Employment Service brought to the job problem entitle its establishment to be called a landmark of labor.



The INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS
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JOSEPH D. KEENAN — International Secretary
JEREMIAH P. SULLIVAN — International Treasurer
ALBERT O. HARDY — Editor, Technician-Engineer

TECHNICIAN ENGINEER

VOL. 13, NO. 2
ALBERT O. HARDY, Editor

in this issue

the cover

An expanding area of communications today is found in the field of aviation. Airline terminals like the one on our front cover—at Atlanta, Georgia—have scores of technicians, employed by the airlines and the terminal itself, to keep flying safe and on time.

index

For the benefit of local unions needing such information in negotiations and planning, here are the latest figures for the cost-of-living index, compared with 1962 figures: December, 1963—107.6; December, 1962—105.8.

commentary

"The Social Security System is the American way to provide hospital care for the aged—it is practical, sensible, fair and just . . . The most powerful of all nations should no longer have to ask our old people to trade dignity and self-respect for hospital and nursing home care."—President Lyndon B. Johnson

President Johnson recommended a hospital insurance program for the aged aimed at two basic goals:

First, it should protect against the heaviest costs of a serious illness—the costs of hospital and skilled nursing home care, home health services, and outpatient hospital and diagnostic services.

Second, it should provide a base that related private programs can supplement.

To achieve these goals:

1—These benefits should be available to everyone who reaches 65.

2—Benefit payments should cover the cost of services customarily furnished in semi-private accommodations in a hospital, but not the cost of the services of personal physicians.

3—The financing should be soundly funded through the Social Security system.

4—One-quarter of 1 percent should be added to the Social Security contribution paid by employers and by employes.

5—The annual earnings subject to Social Security taxes should be increased from $4,800 to $5,200.

6—For those not now covered by Social Security, the cost of similar protection would be provided from the administrative budget.

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Shaune Hardy being interviewed at the Greater Peoria Airport by WAAP Newsman Joe Seachrist.

A Wish,

A CHRISTMAS DREAM COME TRUE

FRIDAY, the thirteenth of December turned out to be a lucky day for a young British boy. A chain of events began that morning in Peoria, Ill., because the local newspaper carried a story of the pen-pal relationship of a pretty high school student in El Paso, Ill., and the Dewsbury, England, lad, a victim of Muscular Dystrophy. The paper told how El Paso students were encouraged to write a letter to a student in a foreign land, as a part of their study assignments. Business Manager Bill Dodson of Local Union 1292 read the story and then began to think about the boy's having said in one of his letters that if he could have anything in the world he would wish to see America, his pen pal and the people and places she had described in her letters to him. For the two youngsters hadn't written just one letter, but kept up a running correspondence. Although Shaune Hardy became confined to a wheel chair some two years ago, he had a will to live, strengthened by the letters from his friend Lynda Terven in the heart of Midwest United States.

The plucky little Briton's eyes sparkle upon his arrival. To his left, his pen-pal, Lydia Terven, and behind him, TWA's Ken Lauterbach.

Dodson began to speculate as to how a holiday visit, perhaps, might fulfill the wish of the boy. But Christmas was only 12 days away. He mentioned his idea to Mr. Ray Diaz, Vice President and General Manager of WAAP, who quickly offered his personal cooperation and that of his station.

Miss Terven lives with an uncle, Mr. Rex Pinkham, and Dodson obtained his approval of the idea—if arrangements could be made. And the arrangements became quite lengthy and complicated—the boy's mother, his doctor, air transportation, ground transportation, passport, Customs, U. S. Public Health Service, etc., etc. Senator Paul Douglas offered the full cooperation of his office and staff, when he was advised of the project. Representatives Al Hardy and Barney Mullady at the IBEW International Office went to work on several segments of Washington officialdom, and red tape flew in all directions.

When it seemed that all the necessary arrangements could be made and were, in fact, made on a tentative basis, a transoceanic telephone call was placed to Shaune

and his mother. This invitation for the visit was accepted. His doctor gave his approval, conditioned upon his being accompanied by some qualified person. This latter problem was overcome by a TWA employe from Peoria, Mr. Kenneth Lauterbach, who volunteered to accompany Shaune and by the Muscular Dystrophy Association's provision of medical teams to meet him and to attend him throughout the trip. Additionally, Dr. Robert Hart of Peoria, well-known for his work in connection with crippling childhood diseases, offered his services.

Of course, one of the problems was to confirm air reservations for flights during the height of the busy holiday season. Trans World Airlines fully cooperated and TWA's Peoria Manager, Mr. John Brown, accomplished two or three minor miracles in that regard.

Dodson then contacted President Marvin Balousek of L. U. 1220, Chicago, who provided an appropriate welcome at the Chicago airport by Illinois Rep. Anthony Scariano, a representative of Mayor Daley of Chicago, Intl. Rep. Thomas Malone from the IBEW Chicago office, and made arrangements for media coverage.

But "the best laid plans . . ." The weather turned foul and the airplane from London had to land at Montreal. All the welcoming festivities had to be postponed 24 hours but everyone cooperated by returning the following day and the event finally went off well on December 24.

A sizable crowd met Shaune at the Peoria airport and he was given a hearty welcome. Among the official committee were Rep. James Carrigan (Peoria), Peoria Alderman Harrison, Mr. Trev Salzer of the Peoria-Tazewell Illinois Labor Council, Mayor Roth of El Paso, representatives of the state and national Junior Chamber of Commerce, Muscular Dystrophy Foundation representatives, Business Manager Dodson and Mrs. Dodson, members of the press, Lynda Terven and her aunt and uncle, WAAP newsmen, and many other interested and helpful people who joined the party.

A motorcade was formed, with police cruiser and helicopter escort, and the happy party was off through Peoria and on to El Paso, Ill. There, a reception was held for him and Mayor Roth presented the honored visitor with a key to the city. The Mayor declared December 24 to be "Shaune Hardy Day" in El Paso, in the course of the ceremony. Shaune was then taken on a fairy-tale shopping tour and was given his choice of gifts, by the business concerns of El Paso, for his family in England.

He spent Christmas Day with Lynda and her family and enjoyed opening many gifts which had been given to him and reading the many Christmas cards which had been sent to him there. Many more activities had been planned, but his general health prevented strenuous activities. He has much to remember—as do those who arranged for his visit and those who met him. IBEW Business Manager Dodson has been quoted as saying that it was all made worthwhile when the smile on Shaune's face was seen by his new-found friends at the Peoria airport.

When he boarded his returning flight from Peoria, Shaune told Brother Dodson, "I've had a smashing time, and I hope that some day I can return to America with my mother and live here forever."

But this is not necessarily the end of the story. As the result of Chicago's Mayor Daley's interest in Shaune's Christmas visit, Brother Dodson reports, the Director of Public Health is understood to be trying to arrange for Shaune's return, to see if some of the medical facilities there can be helpful to him. This would, indeed, add a final touch.

Part of the Reception Committee at the Peoria Airport: L to R: Mrs. William Dodson; Business Manager, Dodson of Local Union 1292; Miss Linda Terven; the mayor of El Paso, the Hon. Dwight Roth; Mr. Trev Salzer, president of the Peoria-Tazewell Illinois Labor Council. Mrs. Dodson presented Shaune with a copy of the John F. Kennedy Memorial recording, which she is holding in this picture.

HOMEMADE CAMERA—Emcee Don Morrow, standing near a professional TV camera costing $30,000, watches in amazement as 16-year-old Norman Ahlquist of Seattle, Wash. demonstrates his homemade TV camera fashioned with $40 worth of electronic equipment, on the premiere telecast of "Science All-Stars" Sunday, Jan. 12.

A $15,000 System For Only $40

HIGH SCHOOL STUDENT IN SEATTLE BUILDS A CAMERA SYSTEM

NEARLY everyone knows what a "bulb-snatcher" is. A young lad in Seattle is even less popular with this sister than a bulb-snatcher. Norman Ahlquist is a *tube-snatcher*. His sister Janet good-naturedly complains that not one of the three radios in the house is in working condition. She explains, "Norman has most of the tubes in his TV project."

The 16-year-old Science Fair winner has invested about $40 in a television camera system which would probably cost about $15,000 if it were bought new. And he bashfully admits that he may have "borrowed" a tube or two, from time to time, and even a part, accounting for some measure of difficulty in the family's radios. He entered his plywood-case in the King County Science Fair and, with First Prize, earned a trip to the National Fair at Albuquerque, New Mexico last May.

Norman has an FCC Radiotelephone First Operator's license but is also interested in other scientific endeavors; glass blowing, chemistry and photography. But his camera, according to qualified critics, is the product of exceptional talent and obvious diligence.

He started to build a camera three years ago, around an iconoscope given to him by a TV station engineer, then he received an image orthicon from another station. Dissatisfied, he rebuilt the camera, adding a set of deflection coils given to him by RCA and aided by KOMO-TV's gift of numerous tubes. KOMO-TV also allowed him the use of some of its test equipment, and more recently gave him a used imo. Along with a 50 millimeter lens from a second-hand still camera he bought for $5 and some parts from a junked signal generator (total cost, $7.50), his 35-pound accomplishment is something of a marvel, all things considered.

The camera being of no use without its necessary adjuncts, he has built a 17-inch monitor, a sync generator, two power supplies, a camera control unit and a wave-form monitor.

Norman is a senior at Roosevelt High School in Seattle and is looking forward to studying electrical engineering in college, possibly at the University of Washington. He says his favorite classroom subjects are chemistry, physics and trigonometry and confesses he doesn't do as well in English and history. His metal shop project at the school is the construction of a cavity resonator, at the moment.

He and two teenage neighbors, David Blessing and Steven Smith, have been building a small cyclotron in the basement of David's home. Their ambition is to be able to bombard pieces of tungsten or silver, in order to generate gamma rays. Considerably smaller than the massive cyclotrons used in research studies in college and industrial laboratories, the Ahlquist-Blessing-Smith device fits in a 12 by 12 foot space and weighs about 30 pounds.

Editor's Note: Our thanks to Jack Walters of Carl Byoir & Associates, Inc., ABC's "Science All Stars" and KOMO-TV for their cooperation in presenting this story.

Wage earners at one of the nation's largest printing and bindery plants have waited almost a year for a shorter work week and other gains

***FIVE PICKETS** from five local and international unions which have been on strike at the Kingsport Press, Inc., in Kingsport, Tennessee, since March, 1963.*

The Printing Trades Stand Their Ground at Kingsport

MORE than 1,300 union members of the printing trades—Bookbinders, Pressmen, Typographers, Electrotypers, and Machinists—are manning a picket line at Kingsport Press in Kingsport, Tennessee, this month, enduring bitter cold and the reduced income of a strike fund in an effort to gain contract benefits enjoyed by other printing tradesmen of the nation.

The unions ask reasonable and long-overdue improvements on these major issues:

- Although *wages* at Kingsport are considerably behind industry averages, wage increases "in line" with those given in competitive plants were asked. This meant about 10 cents an hour. The company offered an average of 3½, 5½ and 5½ cents each year over a three year contract. Therefore the wage inequity would widen rather than narrow between Kingsport Press workers and the rest of the industry.

- The *hours* of work at Kingsport remain at 40 per week for day shift workers, compared with 37½ or less hours elsewhere. The unions asked a 38¾ hour week in the second year of a new contract.

- *Vacation* benefits lag behind not only the printing industry, but behind all industry. Workers must work three years before getting two weeks' vacation, according to the company's best offer. The unions accepted this as an improvement over present benefits, but insisted on workers' equity in vacation pay as deferred wages.

- *Manning* of new equipment and *seniority* considerations for advance of workers to new positions, should be subject to normal grievance procedures including arbitration if necessary, but the company wanted to be sole judge in these issues. The unions felt opportunity for advancement to better jobs according to seniority is of vital concern to workers.

- In private mediation sessions two months after the strike started, compromise was reached on some issues, but not on wages and hours. But a new and important issue was raised when the company insisted that inexperienced workers hired since the strike started are permanent replacements. This means that several hundred union members would not get their jobs back after settlement. The unions will never accept this condition. Negotiations have stalled since about June 1 because of the company's unrealistic demands.

Kingsport Press, Inc., is the major employer in its Tennessee home city. It's one of the nation's largest printing and binding manufacturers of hard cover books. Isolated geographically from the rest of the industry, the company earns excellent profits and enjoys substantial economic advantages over its competitors. But it has been unwilling to match wage increases given elsewhere in the industry. It refuses to reduce working hours to approach industry standards, or to improve fringe benefits as provided by others. It will not arbitrate issues in dispute.

Consequently, the five unions involved are standing fast in this strike, which is now almost a year old.

More than 1,300 of the original 1,700 strikers remain on the picket lines, while the company continues makeshift operations with strikebreakers. As the strike wears on, with negotiations at a standstill, hardships are increasing and economic conditions worsen, but the unions are determined to hold out together for a fair settlement.

For years the Kingsport Press has made identical proposals to all five unions, then attempted to find one union which would accept the package, thus making it difficult for the others to hold out. This year the five unions formed a Unity Committee to formulate common collective bargaining goals and to achieve a measure of equality at the bargaining table.

SUPPORT NEEDED TO WIN

The conviction grows that the five united unions can win this strike by holding on for an equitable settlement. But no union can stay on strike for an extended period without depending on the aid and active support of all areas of union activity. Labor leaders at the local level and on up the line to the international level have all been through strikes and similar times of economic stress. They know how urgent it is for voluntary support, in hard cold cash as well as in sympathy, to flow in from members of labor's great and dedicated brotherhood.

Winning this struggle is of vital importance to the Union movement and its future in the printing and publishing industry. The operation of a non-union plant is always a menace to union conditions. But an anti-union plant is wholly intolerable to both union labor and fair management. The future for union working conditions in the book printing plants is at stake. We cannot lose this strike. We are not losing it. We shall not lose it.

As has been so eloquently said, this is a worthy cause, based upon solid principles and worthy of the support of all union members. Hardship cases keep piling up, and legal fees and other necessary expenses are an ever-increasing worry. Contributions should be sent to:

Allied Kingsport Press Unions
P. O. Box 1097
Kingsport, Tennessee

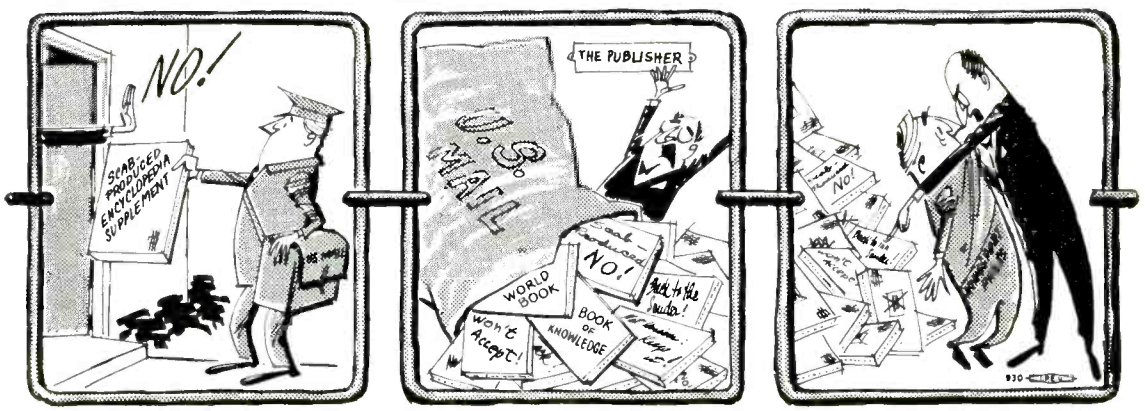
They will be greatly appreciated. They will help do this vital job for the future of the entire union movement in the United States of America.

The unions involved in the strike have deeply commited their limited funds to the needs of their struck locals. The Bookbinders recently voted to assess every journeyman Bookbinder in the nation 75 cents per week until their International Strike Fund is replenished. Other unions have been preparing themselves for a long seige.

AFL-CIO President George Meany sees this as a significant struggle, one in which all organized labor has a stake.

"These gallant men and women are worthy of and deserve the support of the whole labor movement," he has stated.

Let's Start A Chain Reaction!

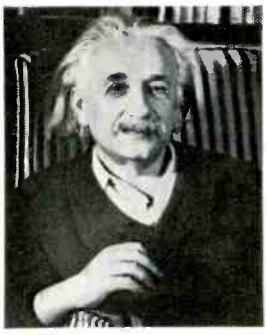


This is the time of year, the Allied Kingsport Press Unions says, that many encyclopedia publishers mail out annual supplemental volumes to "up date" the material in the main volumes or sets. Many such supplements, they add, have been produced elsewhere under union conditions, but two have been produced by strikebreakers hired by Kingsport Press.

Acceptance of delivery of the annual "World Book" supplement published by Field Enterprises Educational Corp. or the annual supplement of the "Book of Knowledge," published by Grolier, Inc., may help prolong the strike and defeat the determined efforts of members of five unions—the Bookbinders, Printing Pressmen, Stereotypers, Machinists and Typographers.

Both supplements mentioned above have been produced at the strikebound plant here despite union requests that they be printed elsewhere.

Since the Kingsport Press management refused to agree to wages and working conditions on a par with those of other major bookplants, strikers have made every effort through negotiation, mediation or conciliation to settle the dispute on reasonable terms without success. Refusing to buy the two encyclopedias listed and returning any supplements mailed to homes may, the allied unions say, hasten settlement of this strike.



FOR INDIVIDUAL AND ECONOMY

Shorter Work Week Was Urged By Famed Scientist Einstein

By HARRY CONN

A SCIENTIST, who many believed had the most brilliant mind of the century, was a staunch supporter of a shorter workweek as an important step toward meeting the problem of high unemployment.

Albert Einstein, whose genius made possible the splitting of the atom, wrote often of the need of a shorter workweek. This is revealed in a collection of the famed scientist's articles, addresses and pronouncements, published by The Philosophical Library, Inc. of New York.

His views are significant because he became an American citizen and closely studied the U. S. economy.

Einstein felt "that the development of industry and machinery has made the struggle for existence very much more severe, greatly to the detriment of free development of the individual.

"But the development of machinery means that less and less work is needed from the individual for the satisfaction of the community needs. A planned division of labor is becoming more and more of a crying necessity, and this division will lead to the material security of the individual.

"This security and the spare time and energy which the individual will have at his command can be made to further his development. In this way the community may regain its health and we will hope that future historians will explain the morbid symptoms of present-day society as the childhood ailments of an aspiring humanity, due entirely to the excessive speed at which civilization was advancing."

Einstein, who left his native Germany in 1933 when Hitler came to power, saw the shorter workweek not only in relation to the freedom of the individual but as a healthy and progressive step for the economy.

He concerned himself with the price-wage problem in the middle 1930's at the time technological change was beginning to make its first inroads into employment and came forward with these three specific recommendations:

"1. A statutory reduction of working hours, graduated for each department of industry, in order to get rid of unemployment, combined with the fixing of minimum wages for the purpose of adjusting the purchasing-power of the masses to the amount of goods available.

"2. Control of the amount of money in circulation and of the volume of credit in such a way as to keep the price-level steady, all protection being abolished.

"3. Statutory limitation on prices for such articles as have been practically withdrawn from free competition by monopolies or the formation of cartels."

Although Einstein wrote these views during the worldwide depression, many of his concerns reflected today's problems and many of his recommendations have been incorporated into the scientist's adopted land.

For example, he believed that our fundamental trouble is that "to satisfy the needs of the world today nothing like all the available labor is wanted. The result is unemployment and excessive competition among the workers, both of which reduce purchasing power and put the whole economic system intolerably out of gear."

Einstein devoted much thought to two problems that we are concerned with today: jobs for our younger people and protections for our elderly.

Writing to a colleague, he declared:

"I also share your conviction that steps absolutely must be taken to make it possible and necessary for the younger people to take part in the productive process. Further, that the older people ought to be excluded from certain sorts of work (which I call 'unqualified' work), receiving instead a certain income, as having by that time done enough work of a kind accepted by society as productive."

This country owes much to Einstein. He came here in 1933 after leaving Nazi Germany to work at Princeton University.

In leaving his homeland he made his famous declaration: "As long as I have any choice, I will stay only in a country where political liberty, toleration and equality for all citizens before the law are the rule."

Many countries invited him but he decided the United States offered him the best haven for his work. He became a citizen and lived here until his death, and we are now enjoying the rewards of his rich mind.

Editor's Note: The following are excerpts from a commencement address by Secretary Wirtz at the Mid-Year Graduation exercises at the University of Michigan, Ann Arbor, Michigan.

The Robot Spectre

By W. WILLARD WIRTZ
U.S. Secretary of Labor

A century which dawned on an industrial revolution, that saw men concerned about becoming slaves, has reached its high noon in a revolution of technology haunted, rather, by the spectre of becoming robots.

A few miles from this hall, ten employees man a machine that makes automobile motor blocks 400 men worked on ten years ago.

Fourteen operators attend the glass-blowing machines that makes 90 per cent of all the glass light bulbs produced in this country.

Two workers now turn out 1,000 radios a day—the product of 200 workers a few years ago.

A machine translates an issue of Pravda into English in half an hour. Another traces precedents in the law library. At Cal Tech, a computer reports at the end of three hours the results of 80 million calculations required to trace the evolution of the sun over its 4.5 billion year lifetime.

Among the more athletic set, one machine plays now an excellent game of checkers, another a good game of chess except for the end play, and a third a relatively good hand of bridge. And there was last month's report even of cybernetic sacrilege—the Scottish computer that has proved that St. Paul was the author of only five of the fourteen epistles attributed to him in the New Testament.

It is only a matter of time, surely, until some clanking robot will draw itself erect and announce: Cogito, ergo sum.

Between now and this time tomorrow, 4,400 people will have stepped aside from their jobs, or moved on to others, because machines will be doing what they are doing today.

Yet any philosophy or policy about automation must necessarily start from clear recognition that unrestrained technological advance is not only inexorable, but essential to the maintenance and elevation of the standard of living.

Full employment in this country is completely dependent on our being more efficient producers than our competitors in a world where the competition is tougher every day. The alternative to automation would be economic stagnation.

It is equally clear that the prevalent myths about automation are narcotics dulling the national sensitivity to the necessity of averting men's mastery over machines.

The myth that automation is only a new stage in an old process is akin to the thinking that splitting the atom represented only an evolutionary development in the dynamics of war, a projection of the first use of the cross-bow or the Trojan horse. Technology has wrought as large a change in the necessary thinking about the future work as about the future of war—but the answer here is obviously not to stop it.

The comforting myth that we can always pull the plug of a machine out of the wall disregards the fact that we won't. And the companion piece about "nothing coming out of machines except what men put into them" disregards the fact that this is probably no more true now of some machines than of some men.

The most dangerous myth, in immediate times, is that machines produce as many jobs for men as they destroy and therefore represent no threat to workers. This is a half truth, and therefore a half lie. The truth is that machines *permit* the extension of men's work activities. The implied lie is that this will happen automatically or without the exercise of full human responsibility.

The machines now have, in general, a high school education—in the sense that they can do most jobs that a high school education qualifies people to do. So machines will get the unskilled jobs, because they work for less than living wages. Machines are, in the most real sense, responsible for putting *uneducated* people out of work.

The jobs the machines create, furthermore, are usually for different people from those they displace. This doesn't matter if labor is viewed as a commodity. What it means, however, in more understanding terms is that the bargain a machine strikes with a man is that it takes one job and offers in return another—stripped of the worker's seniority accrued vacation benefits, pension rights, and the value of the skill he had spent a lifetime developing.

The answers are not to smash the machines. They are to recognize that the individual versus the machine is as unfair a match today as the individual versus the corporation was in the last century, and that advancing technology requires the exercise of collective—public and private—responsibility for its effects and collective measures to carry out this responsibility.

For Our Nautical—Minded Technicians

An underwater communication system that utilizes only the human ear as the receiver was shown by The Bendix Corporation at the New York Boat Show, last month.

The device, known as "Watercom," enables a diver to talk to all others beneath the surface of the water within a range of 100 yards. The sound of his voice is amplified, then carried through the water, and can be heard without the aid of special receiving equipment.

The television networks have shown an interest in the device's possible use in special broadcasts, documentaries, and sports events.

Walter P. Rhea, general manager of the Bendix Marine Department, said the system includes an electronic transmitter which attaches to the diver's air tank, a special mouth mask that allows the diver to move his lips freely and enunciate his words, and a throat microphone.

Rhea said any standard breathing apparatus can be attached to the mouth mask and that it can be used with a standard face plate. The diver's breathing regulator connects to the mouth mask, replacing the mouth bit which the diver clenches in his teeth. Rhea explained that replacing the bit with the mouth mask gives added safety because in cold water there is a tendency for a diver's lips to become desensitized—allowing the bit to slip from his mouth. Moreover, the bit often causes discomfort, he noted.

WELL EQUIPPED—Gail Cooper shows what the modern diver will wear if she wants to talk to other divers beneath the water—the new Bendix "Watercom" underwater communication device. The stainless steel cylinder attached to her air tank contains a battery-operated transducer, or underwater transmitter, which amplifies the voice through the water so it can be heard by all other divers within 100 yards without the aid of special receivers. The unusual-looking mouth mask she wears enables her to enunciate her words by using her lips, and a throat microphone picks up the spoken words for amplification and transmission by the transducer. The breathing apparatus attaches right to the mouth mask, eliminating the breathing bit normally clenched between the diver's teeth.

BOATING ELECTRONICS—Diana Dean makes a ship-to-shore call on a Bendix radio-telephone while surrounded by nearly every type of electronic navigation and communication device used by boat owners. Other equipment pictured includes radar, depth recorders, depth indicators, radio direction finders, Loran (long range direction finder), and explosive fume detector.

The transmitter is housed in a cylinder approximately 14 inches long which fastens to the diver's air tank by means of a metal strap. At one end of the cylinder is a specially designed transducer which transmits sound through the water. The battery that provides the power is the size of a quart can of motor oil and is quickly and easily inserted into the end of the stainless steel cylinder. The entire unit weighs only approximately five pounds under water, he added.

"Watercom" can be operated to any depth to which the diver is capable of descending since the pressure on the inside of the unit is automatically adjusted to equal outside pressure.

Rhea said the "Watercom" unit for divers, available now, retails for $239 less batteries. The disposable battery is $12.95 and the rechargeable battery is $89.

Continued on Page 12

The mouth mask can be purchased separately at $7.95.

A boat-based version of the "Watercom" underwater communication system will be available in March, Rhea said. It includes a transducer and hydrophone which are hung over the side of the boat into the water, and a person using an ordinary microphone will be able to talk to all other divers within 150 yards of the transducer in any direction.

The hydrophone enables the unit to pick up the sounds from below the surface. Thus, a diver using "Watercom" can conduct a two-way conversation with the operator of the boat unit. This "Watercom" unit will sell for $395.

The equipment is expected to receive enthusiastic reception by commercial and professional divers, Rhea said. He indicated that "Watercom" could be used by many different military units, and foresaw a civilian market among the approximately 7 million pleasure divers in the United States, of whom it is estimated that approximately 250,000 make at least one dive each week.

'CHORUS' INVESTIGATION

"Chorus," a natural electromagnetic phenomenon in the very low frequency range, probably originates in the exosphere. An understanding of this phenomenon can lead to an enhancement of knowledge of the environment of the exosphere and ionosphere. In an attempt to determine its origin the National Bureau of Standards is investigating it.

Chorus, originally named "Dawn Chorus" for its resemblance to sounds of birds in the English countryside at dawn, generally consists of a multitude of rising tones. Each tone rises from 1-2 kc to 3-4 kc, usually lasting 0.1 to 0.5 second. It is often accompanied by noise or hiss, covering the same frequencies. Often it will occur in bursts, starting from a background of little or no chorus, rapidly building up in intensity and repetition rate, and then receding to background noise. No adequate theory of its origin is accepted, although several hypotheses have been proposed. The best known is the traveling-wave hypothesis; others include plasma oscillations in the exosphere, Cerenkov radiation, and radiation from protons spiraling down the field line with gyromagnetic frequency Doppler-shifted by an amount depending on the velocity of the particles and the ambient electron density.

Since chorus is an ELF/VLF emission it can be received on equipment for listening to "whistlers," another VLF phenomenon. This has made many stations readily available for chorus observations. The equipment used consists of a VLF antenna, an amplifier having a voltage gain of about 10^6 and a bandpass from 500 c/s to 15 kc/s, and a tape recorder. The antenna used at the College, Alaska station, for example, is a delta-shaped loop antenna 30 feet high and 60 feet across the base.

The occurrence of chorus is greatest in the regions between 60″ and 70″ geomagnetic latitude in both hemispheres. While experimental scatter prevents more accurate determination of this region, the correspondence with the auroral zones seems significant. Chorus activity shows seasonal variations at all stations, but not in the same pattern for all; some stations exhibit maxima during winter and others during summer. However, chorus activity does seem to reach its peak during summer at stations at low latitudes and in winter at high latitudes, although additional evidence is needed to render this finding conclusive.

'HOT ELECTRONS'

A new "hot electron" propulsion technique that could be used to propel spacecraft to the farthest planets at speeds of 100,000 miles per hour or more has been developed and successfully tested in the laboratory by scientists of the Radio Corporation of America. The new system ejects electrons and ions in the manner of a rocket exhaust, at a rate of six miles per second, to generate sufficient thrust to accelerate a vehicle in space over long periods once it has been boosted from earth by conventional rocket power. An experimental unit operated at RCA's David Sarnoff Research Center in Princeton, N. J., has completed a 1,000-hour test, during which it was stopped and started numerous times, without any deterioration in its components or its performance.

The principles used open the way to a new family of long-lived electric engines whose ability to stop and re-start on command could extend their operating usefulness to missions lasting for several years. Such engines would be practical for many purposes, including the orientation of vehicles in space, shifting them from one orbit to another, or propelling them on long voyages to the edges of the solar system.

MANAGEMENT POLITICAL ACTION

The new organization called the Business Industry Political Action Committee (BIPAC) won't lack for pin money to elect conservatives . . . The National Association of Manufacturers has put up $100,000 as a launching fund.,

—News and Views, Ohio AFL-CIO

READING TIME

Review of Current Books on Labor, Broadcasting & Recording

FCC's Field Services Increase; Number of First Class Ops Up

Annual Report for 1963, *Federal Communications Commission, Government Printing Office, Catalog No. CC:1.1:963, Superintendent of Documents, Washington 25, D.C. 59 cents,*

The Annual FCC Report for fiscal 1963 has just been issued.

As might be expected, there is more material in the section devoted to Space Communication and the substitution of the Emergency Broadcast System for Conelrad is noted in the section entitled, "National Defense."

Reorganization of the Field Engineering and Monitoring Bureau into the "Field Engineering Bureau" is outlined. The former Field Operating Division now has three basic units—Engineering and Facilities, Monitoring System, and Field Offices. It is noted that, during 1963, congressional authority was given to the Commission to impose monetary fines upon licensees of non-broadcast stations guilty of repeated or willful specified infractions. This authority is anticipated to be especially helpful in enforcement in the Citizens Radio and small-boat fields. As the 1963 Report puts it, so well and delicately, "Both services are increasing in a phenomenal manner, with many users unwilling to adjust themselves to the restraints necessary for an orderly and efficient communication service."

Inspection in the Broadcast Services were augmented by a third TV mobile enforcement unit and, altogther, more emphasis was placed upon TV and FM inspection and monitoring than in prior years. As the Commission points out, mobile monitoring units are the only practical answer for the necessarily close-by observations. Of the 15,829 Broadcast Service licenses outstanding, the Report shows 1,851 inspections were accomplished, 1,712 violation notices were issued. Additionally, 178 violation notices were issued as the result of inspection monitoring. Inspections in the services other than broadcast, amateur and ship have a considerably better score. Of 7,074 inspections, 3,217 notices were issued and 2,402 notices were issued as the result of monitoring.

The number of First Class Radiotelephone Operators licenses again increased in 1963; those outstanding on June 30, 1963 numbered 149,655—an increase of 22,052. Radiotelegraph First Class licenses numbered 10,677 at the end of fiscal 1963, an increase of 887 over 1962.

Presumably due to the Commission's "freeze" on AM and FM broadcast licenses, there was a decrease in number of applications in 1963; only 14,519. The totals, however, show 3,997 commercial AM, 666 commercial TV, 1,716 TV translators and boosters, 91 educational TV, 1,207 commercial FM and 238 educational FM authorizations, as of June 30, 1963.

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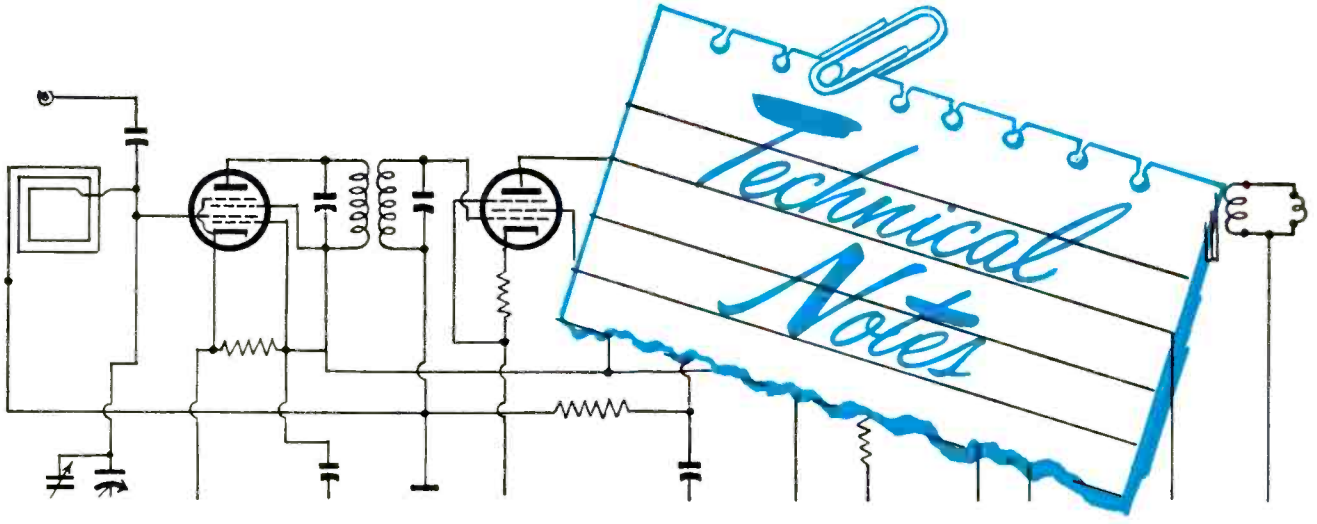
THE LABOR MANAGEMENT WHIRL

● *IN NEW YORK CITY, corporations that think nothing of dumping hourly paid employees out on the street when they have reached retirement age now ensconce their over-age executives in plush skyscraper suites. The executive suite plan for retired bigshots was dreamed up by a renting agency, Cushman & Wakefield. The plan is based on the simple idea that corporation presidents, board chairmen and others don't mind pushing others into retirement but resist the same thing applied to them. Therefore, their companies rent expensive suites so that the executives can continue to play tycoon. James Washington, Vice President of Cushman & Wakefield, said that one major firm phoned him and asked him to find an office for an ex-president "so we can get him out of our hair."*

● *IN PHILADELPHIA and CAMDEN, N. J., union workers who produce the nation's guided missiles were more than a little miffed when Presidential candidate Barry Goldwater smeared the missiles as defective and "unreliable." Once again, however, it developed that Goldwater had tripped himself up.*

Just three years ago in a speech at the Lawrenceville School, at Lawrenceville, N. J., Goldwater raved about the accuracy of the same missiles. He was quoted as saying, "We've got one that can hit the men's room in the Kremlin."

● *IN WASHINGTON, D. C., a gag definition circulating in the Pentagon asserts that "Automation is when you replace a $70-a-week clerk with a $400,000 computer."*



VIDEO FORE AND AFT

In Kobe, Japan, the world's most completely automated freighter, the Mississippi Maru, was launched by the Kawasaki Steamship Company and immediately became an international sensation. Foreign shippers and shipbuilders were chiefly fascinated by the fact that the ship will be operated by a crew of only 20 men—21 fewer men than the number needed on a sister ship built only 14 months ago. Maritime unionists were intrigued by the use of closed-circuit television cameras at the prow and stern, a system that will eliminate anchoring and mooring crews. A bit later, union officials discovered an oversight. The builders had rigged television systems on the outside hull of the ship, but there wasn't a single TV set inside for the crew to watch.

SUNSPOTS PLAY HAVOC

When spots speckle the surface of the sun, radio signals are apt to bounce crazily about the globe.

During a recent peak of sunspot activity, London television viewers were startled to hear a New York taxicab dispatcher ordering a driver named "Mac" to proceed posthaste to Flatbush Avenue.

Two girls frankly discussing a blind date on the telephone enlivened a New Jersey radio station's programming in another sunspot-induced communications freak.

Sunspots also have been associated with everything from swallow migrations to the French revolution, the National Geographic Society says. The evidence for these far-reaching effects is shaky, but the spots apparently do influence a variety of things.

A French researcher found that great vintages in Burgundy wines follow maximum solar activity.

Biologists in Iceland discovered that the North Atlantic lump-fish, a source of caviar, proliferates when the sun is spotty. The cod, however, prefers a clear sun.

New York psychiatrists recently computed a correlation between mental hospital admissions and intense sunspot disturbances.

Sunspots have been observed and described since the ancient Chinese thought they saw "flying birds" in the sun. The spots cannot be seen by the unaided eye except when the sun is shrouded by mist, fog, thin clouds, smoke, or when it is reddened at dusk.

In 1371, great forest fires in Russia darkened the skies. A chronicler wrote: "There was a sign in the sun . . . dark spots on the sun, as if nails were driven into it . . . the murkiness made it impossible to see anything for more than seven feet."

The spots look dark only by contrast with the more luminous surface about them. They actually have a temperature of about 4,000° Centigrade.

Galileo detected sunspots shortly after he built his telescope in 1610, but his findings were challenged. The master philosopher Artistotle had taught earlier that the sun was without blemish, and Galileo's critics said the spots he saw must be in his eyes or on his telescope lens.

The sunspots are not mere blemishes. They are great vortexes of gas on its surface. Many measure 40,000 miles across; a giant spot spread 200,000 miles in 1947. The smallest spots last less than a day; the largest persist for several months and move as the sun rotates.

In the 19th century, German astronomers detected that the spots normally appear in 11-year cycles. One of the most assiduous observers was Samuel Heinrich Schwabe, of whom it was said, "The sun never rose unclouded above the horizon of Dessau without being encountered by Schwabe's imperturbable telescope."

Astronomers are not sure what causes sunspots. One theory is that they stem from magnetic interference with heated gas as it rises to the sun's surface by convection. Convection currents develop because gas expands and rises as it becomes hotter—like the air above a radiator.

A sunspot's magnetic field—thousands of times

stronger than the earth's—pours out streams of electrified particles at 1,000 miles a second. These often play havoc with communications.

But sunspots also aid overseas radio transmission by strengthening the ionosphere, thus making it more reflective for radio signals.

STANDARD CELLS—THE VOLT

The National Reference Group of standard cells maintained by the National Bureau of Standards (U. S. Department of Commerce) was established to serve as the physical standard for the volt in the United States. The electromotive forces of cells within the group, as determined by absolute measurements of the ohm and ampere, have varied by less than 7 parts per million over a period of 50 years.

Saturated standard cells which have been compared with the cells in the National Reference Group are used as working standards in various research areas within the Bureau. Some of the uses of saturated cells are: the Bureau's calibration of watt-hour meters, the determination of the faraday, and the determination of the gyromagnetic ratio of the proton. Clearly, saturated standard cells are a necessity in many phases of research, development, and manufacture. Furthermore, the Bureau provides calibration of unsaturated standard cells used in its own programs.

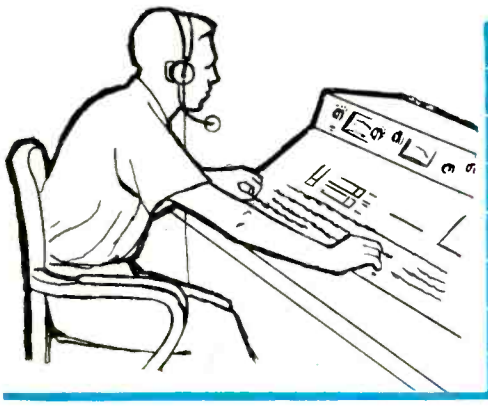
Calibrations of saturated standard cells are performed for public utilities, universities, research institutions, other government agencies, and private industry. Those in industry for whom testing is performed include manufacturers of electrical equipment, such as standard cells, and manufacturers of military devices, such as missiles and rockets. This service is achieved by means of working groups of saturated standard cells maintained at the Bureau's laboratories in Washington, D. C., and Boulder, Colo. The emfs of the cells in the working group at Boulder are determined using a transfer group of saturated standard cells, the mean emf of which is measured by comparison with cells in the National Reference Group at Washington, D. C.

The National Reference Group today consists of 44 saturated cells of the cadmium sulfate type, all made at the Bureau. Eleven of these cells were made in 1906 and have been included in the group since 1911, when the International Volt was defined in terms of the Weston cell. In addition, there are now in the group some cells made in 1932 and added (after aging) in 1937, and some cells made in 1949 and added to the group in 1955.

Unsaturated cells should be calibrated using a group of saturated standard cells every year or at least every two years, since, on the average, they decrease in emf at the rate of 20 to 40 microvolts per year. In keeping with the Bureau's long-standing policy of discontinuing services when such services can be adequately provided by other laboratories, routine Bureau measurements of unsaturated cells were discontinued as of June 30, 1961. The Bureau, however, does compare unsaturated cells for public utilities and other agencies conducting operations that require direct Bureau services. The Bureau also continues to conduct referee tests.

All evidence concerning the emfs of the cells in the National Reference Group indicates that they are highly stable. Comparisons made since 1911 between the emf of any cell in the group and the IR drop within a standard resistor have shown that the emf of the group is within the absolute uncertainty of 7 ppm, that is, the emf has not changed by as much as 7 ppm (7 uv) from 1906 to 1963. Such a change would be equivalent to 0.12 uv/yr. and actual change probably is much less.

DRAFTING CLOSEUPS—Students in drafting and engineering design courses at Stanford University's School of Engineering, California, get a closeup look at their instructor's drawing board via four big 23-inch TV monitor screens mounted around the classroom. The TV teaching aid is supplied by Ampex Corp. of Redwood City, which has loaned the school $60,000 worth of videotape and TV control equipment. Key man in the transaction was John M. Leslie, a former Ampex vice president who is now a lecturer and research associate at Stanford. Leslie uses a zoom camera mounted over his drawing board to teach his class in Engineering 9, a course that includes "descriptive geometry, techniques of drafting, and freehand sketching." A five-inch monitor screen mounted on the side of his drafting table shows him what the class sees. The videotape equipment enables him to pre-record special drawing instructions as well, and the tapes can be played for different classes or repeated as needed. In this way he is able to note reactions of various groups, and to move about the classroom giving assistance and advice to individual students.



STATION BREAKS

$54 MILLION, UNPAID WAGES

Sharply increased violations by employers of the Wage-Hour Act were uncovered during 1963, the U. S. Labor Department reports. Cases investigated by Department agents brought to light a record total of $54 million in pay withheld from employes under the act.

Of this, over $32 million represented overtime pay due, but not paid, to nearly 220,000 employes, and $20 million covered the amount that fell short of the minimum wages due to over 186,000 employes.

The employers have agreed to pay $20 million of that sum. The Department is suing to collect the rest for the shortchanged workers.

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FLORIDA'S FIRST FULLTIME 50 kw

Station WGBS, Miami, Florida, where members of Local Union No. 349 are employed, will soon become its state's first fulltime 50 kw station. Its new $500,000 transmitter becomes operative this summer. The station now broadcasts 50 kw daytime and 10 kw at night.

The station is establishing a new transmitter site in Broward county, north of Miami's Dade county. A seven-tower directional antenna complex will extend the station's coverage throughout the Caribbean and into South America.

Separate transmitter equipment has been purchased for WGBS-FM, which will increase its effective radiated power from 18 kw to 100 kw.

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FCC WARNS ON CALL LETTERS

Radio and television stations that drop any of their call letters in identifying themselves on the air are violating an FCC rule, no matter when the abbreviated identification is given.

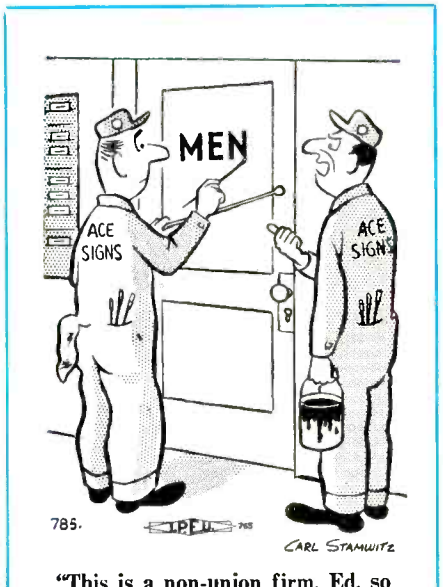
The Federal Communications Commission passed this information on to stations in Louisville, Ky., after receiving a complaint that "several stations" in that city were not using all of their assigned call letters.

FCC says that, although stations must give all their call letters, as separate letters, at each mandatory station-identification spot, the commission doesn't prohibit phonetic renderings of call letters at other time. For example, a station assigned the letters K-O-O-K could call itself "Kook" in station promotion spots . . . other than at identification breaks.

But, it emphasized, the stations must use *all* the call letters assigned and in proper sequence—any time the call letters are used.

The commission said a station giving less than its full complement of call letters could be guilty of a false identification, in that a licensee in some other part of the spectrum might have such call letters.

LAST LAUGH



"This is a non-union firm, Ed, so why flatter the employees?"