IEEE

the Life Members newsletter

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Summer 1996

I am pleased to report that the problem of the Life Members Algorithm is rapidly approaching a solution. Although the details still have to be resolved, it appears that IEEE members who joined before 1994 will be "Grandfathered." The details of how the members who joined in or after 1994 will be treated are still being resolved. The details of the proposed revisions are described on page 8.

In an effort to stimulate activity for and by Life Members in the Sections, the Life Members Committee will host a luncheon at the Sections Congress in November in Denver. At that time we will have an opportunity to describe the types of Life Member activities that have been successful in certain programs, along with the type of support available. A related concern has been the difficulty with retaining recent graduates as IEEE members. Perhaps this is an issue that might be addressed at the Luncheon. You are invited to write us with a description of the LM activities within your IEEE Section.

Recently I received a letter from an old friend who was faced with a problem that many of us have to deal with. Now that many of us have retired, what do we do with all the archival literature and material that we have accumulated during our careers? There was a time when we could donate the material to Eastern Block Nations, to schools, to local libraries, etc. No more. With the advent of E-Mail, the World Wide Web and the end of the Cold War, it is almost impossible to give the material away. The best advice we have heard is to contact your local recycler. If anyone has a better idea, we would like to hear from you.

I recently received an E-Mail message from Ann Hartfiel, Manager of Professional Programs of IEEE-USA, in which she called my attention to a meeting to be held in Boston on the 26 and 27 of April at Northeastern University. The meeting was about a program called RE-SEED (see page 7), which is devoted to the preparation of retired volunteers with Science and Engineering backgrounds to assist middle school science teachers with activity based teaching. This program is a natural for IEEE Life Members. I attended the two day meeting at Northeastern. I was impressed with the dedication and the care in which the program is administered. At the meeting, there were representatives from Oregon, Georgia, Denver and Washington DC. This is perhaps one of the most effective educational assistance programs I have been aware of. Part of the focus of the two day meeting was to explore the possibility of extending the program throughout the entire country. This program deserves the attention not only of the Life Members Committee, but of the entire IEEE.

Theodore S. Saad, Chair
Life Members Committee

War stories

Of Locusts and Engineering

In the 1960s, I was the radar project engineer on a Stand-off Target Acquisition and Night Observation (STANO) experimental program. This comprised a remotely controlled modified battlefield surveillance radar and a high resolution TV system which were mounted on an ASW drone helicopter. While waiting for our flight test range window time, the ECOM (US Army Electronics Command) test supervising engineer, the drone pilot, and I discussed the history of drone surveillance system and engineering. At the time, there was an outbreak of 13 year Cicadas in the area. We commented on the similarity between complex system design timing and locusts. It still exists.

A "new solution" for this old radar problem from World War II days (in our case battlefield surveillance and threat evaluation) was proposed by the "system experts." The solution addressed and solved many established problems, and was pushed through the system proposal stage to RFQ's (about two years). Individual subsystems were designed, built, modified, and integrated into a system (about two years). Preliminary system testing (about one year) verified performance of individual components and concepts. Field tests (war games) simulating actual operating conditions took about one year.

The field test program uncovered all the basic flaws (i.e., operator fatigue, terrain shielding, pilot/observer coordination, operator saturation with multiple targets, operator disorientation with moving terrain feature, higher crash rate of drones, etc.) overlooked in the enthusiasm of the system design and the "great solution" although the individual systems worked well. Solutions to correct the problem were proposed. However, the program was killed since the cost and complexity was too large to allow aggressive deployment of the system (about one year). This was because the testing also uncovered problems with standard procurement items. The test report distribution was limited to prevent embarrassment to previous managers and suppliers. Project personnel moved on to other programs. The program was labeled a failure and all references to it forgotten with the dispersal of the project personnel. All reports were relegated to various archives (about seven years).

Now about 13 years have elapsed since this proposal's inception. Thus, a new crop of bright systems specialists emerge proposing that putting a surveillance system in a drone balloon will solve all the problems. No one checks the archives for previous similar systems. If by chance anyone remembers the previous system and brings up the practical difficulties (blurred by memory), they are brushed aside as negative thinkers. Modern technology has eclipsed the stone-age equipment of the previous program. However, the problems are still there since they involve human factors and very basic surveillance problems.

There were drone aircraft/surveillance programs before the one I was on, and there have been at least two that I know of since (seventies and eighties), so the Engineering-Locust syndrome does seem to exist. Engineers and systems specialists/scientists should remember the old saw about those ignoring history being doomed to repeat it.

Walter W. Frey, IEEE Life Senior

NOTE: Cicadas are called locusts sometimes. (Locusts are actually grasshoppers.) Periodical cicadas emerge every 13 or 17 years. Males are noted for their shrill singing.

Recording those First Steps

I came to Palestine in 1936 from Berlin, Germany – where I was born – via Paris, as a refugee from the Nazi regime. My father, Hans Hellinger, was a mechanical engineer, who "opted" for radio in 1923. He opened in Tel-Aviv a small workshop building radio sets. As he had very advanced ideas, he asked my grandfather, who was coming to visit us, to smuggle in a disc recording machine in order to widen the scope of his work. This way we set up the first and only privately owned recording studio in Palestine.

When World War II broke out, I was put in charge of the recording studio. I was recording 78 RPM discs for the British Army's Cultural Department ENSA and its Army Radio Station as a contractor. Later I also recorded small 15 cm. (6 inch) flexible discs for soldiers to send "their voices home." As there was no material available, we cut the discs out of old X-ray films.

I continued this work after the war. As a result, I was approached by the Jewish underground radio stations of the Hagana, the Itzl and Lechi freedom fighters. (They were demanding Israel's independence from the British Mandate.) I agreed to record material for them, too. My work also included the actual operation of the Hagana underground station "4 x 4 VAV" under the Communication Department Officer Yeshayahu Lavi. (He was later a Senior member of IEEE and, unfortunately, passed away in his prime.)

So I actually served four masters at the same time. Luckily, the British Forces never found out. Otherwise, my life might have gone very differently.

Luck held even further. During the late forties, radio commentators – such as Swedish, Swiss and American broadcasters – used my studio to send recordings about the Jewish Independence movements back to their radio stations. So it came to be that American broadcasters found out the "secret" that the Jewish State would be established on the 14th of May 1948 two days in advance. They asked me to be ready to record – as usual – one 78 RPM discs (approx. 4 1/2 minutes) from the proceedings at the Museum of Tel-Aviv.

My father insisted that we take with us an extra recording machine so that we could cover the whole event. We started the second recorder when the first one came to the end of its disc. This way we managed to record and preserve the whole declaration on discs for posterity.

Yes, those were times when our complete equipment, amplifiers and recorders, weighed around 100 kilograms.

How things have changed since. I sometimes wonder if the younger generations realize and appreciate how much technical engineering advancement has made life easier . . .? For me all that remains are old souvenirs and a few precious and unique recorded discs of the first steps of Israel.

Horst Ralf J. Hellinger,
IEEE Life Member

A) Employment and Income Profile

Employment Status *(as of January 6, 1995)*	Respondents		Median 1994 Income	
	Number	Percentage	Primary Sources	All Sources [1]
Retired, employed full time (FT)	73	1.3%	$70,000	$91,000
Retired, employed part time (PT)	155	2.7	11,075	63,480
Retired, not employed	896	15.4	0	45,000
All respondents	5,827	100.1 [2]	61,000	65,520

1 *"All Sources" includes all primary sources, plus supplemental earned income and other incomes directly related to employment such as profit sharing, pension benefits, and Social Security.*

2 *Percentages may not sum to exact totals due to rounding of component values.*

B) Percentage Earned by Source and Employment Status

Employment Status as of January 6, 1995	N#	Percentage of 1994 Income from:				
		Primary Sources		Secondary Sources		
		Salary	Commission/ Bonus	Second Job/ Overtime	Retirement/ Social Security	Profit Sharing/ Other
Retired and employed, FT	73	61.5%	3.7%	1.6%	26.3%	6.9%
Retired and employed, PT	155	34.3	3.5	6.2	41.8	14.2
Retired, not employed	896	7.9	0.7	0.8	68.2	22.3
All respondents	5,827	80.9	3.5	1.2	9.2	5.2

Charting where the money comes from

The results shown here are from the twelfth salary survey done by IEEE since 1972. This is part of an ongoing effort by IEEE to provide short and long term income trends. Five sources of income are considered: 1) regular pre-tax salary and net income from self-employment; 2) commissions, bonuses, etc.; 3) supplementary earnings, including income from overtime, consulting, teaching and part-time jobs; 4) retirement/ pension plans and Social Security; 5) profit-sharing and other miscellaneous sources.

The distribution of income by age has the same expected "maturity curve" as for salary distribution for professional experience. That is, the income increases at a fairly rapid clip in the early years then at a much slower rate later on. The primary income peaks then basically stays steady (with some fluctuation) from age 50 to age 64. After that, it starts dropping noticeably.

Overall, older respondents reported substantially better compensation than those in the past. Some of the improvement may be from the relatively good income enjoyed by full-time self-employed workers (who appear to include a substantial number of very experienced consultants). The other factor may be engineers who have retired from previous jobs but continue to work full time.

C) Median Salaries

Age Group	Survey Year				
	1987	1989	1991	1993	1995
55-59	$60,000	$63,336	$71,000	$77,875	$79,900
60-64	60,000	63,100	70,000	73,200	82,000
65-69	56,000	62,840	69,000	80,000	78,000
70 & older	57,546	– – – –	60,000	71,000	75,900

D) Percent and Absolute Change in Salary

Age Group	Period of Change									
	1985-1987 (1987 Survey)		1987-1989 (1989 Survey)		1989-1991 (1991 Survey)		1991-1993 (1993 Survey)		1993-1995 (1995 Survey)	
	%Change	$Change	%Change	$Change	%Change	$Change	%Change	$Change	%Change	$Change
55-59	10%	$5,100	9%	$5,000	9%	$5,300	8%	$5,000	6%	$4,075
60-64	9	5,000	9	5,000	8	5,000	7	4,480	6	4,100
65-69	8	4,000	9	5,000	9	5,000	7	4,970	6	4,000
70 & older	5	2,325	– –	– –	– –	– –	7	5,000	– –	– –

Chart C compares *matched positions* not the experience of individuals. Thus, those in the 55-59 age bracket had their median salary increase by two thousand, while those in the 60-64 age bracket had their median salary jump by almost $9,000 in two years!

Chart D is based on data from the survey which requests the respondents to give their base salary rates for the current year, the preceding year, and the year before that. There is a consistent pattern in which real income rises with increased experience up through the first thirty years of experience. It then begins to level off despite the additional years on the job. Again, these data reflect the maturity curves of engineering compensation. (Some slackening in the degree of increases over the five surveys reported may be attributed to lower inflation rates during the same decade.)

Other differences in income for older engineers and other respondents is the contrast between income from all sources, and the total household income which includes other breadwinners. Clearly, other household members are a substantial additional source of income for the engineer upon hitting his or her forties. The difference ranges from $10,000 to $18,000 in increased income for those 65 and older.

Note: IEEE's membership has gotten older. Of course, you already knew that. The respondent's median age for the 1993 salary survey was 41; in 1995, the median age was 43. The average age, however, has been breaking records. From 1983 through 1989, the average age hovered around 40 to almost 41. Then in 1991, the average age jumped to 44, then to 45.1 for 1993. The average age for the 1995 survey was 48. Also, in 1993, 90 percent of the salary survey respondents were under the age of 60; in 1995, 88.7 percent were under that threshold.

Source: **IEEE U.S. MEMBERSHIP** ***Salary and Fringe Benefit Survey 1995***

Nighty, night

Why is a good night's sleep so important? Craig Heller, a Stanford University (CA) biologist, and Joel Benington, a Stanford research scientist, have a theory on why humans need a deep, restful sleep to function properly mentally. Our brains need to replete their supplies of glycogen. (A white, tasteless polysaccharide that is the chief storage carbohydrate of humans and other animals.)

Glycogen supplies less than six percent of our brain cells' fuel needs. The rest comes from glucose delivered via the bloodstream. However, glycogen can be called into use quickly. Thus, the demands of highly active cells in localized regions of the brain can be met. Glycogen acts like a spare battery running during temporary power outages. Because the brain does not burn fat, glycogen is the only source of spare energy for neurons.

During normal thinking and reacting, Heller and Benington speculate that glycogen is gradually used up at least in certain regions. The individual experiences glycogen loss as an increasing need for a good night's sleep.

Glycogen loss also triggers the release of adenosine. Heller and Benington believe the adenosine released increases when glycogen is depleted. And that the adenosine acts as a messenger to the cells promoting restful sleep.

Initial experiments support this premise. Benington injected rats with a chemical similar to adenosine after they satiated their sleep need. The rats returned to a deep sleep as confirmed by EEG's (electroencephalograhic scans).

What about the circadian rhythm? The biological clock that tells humans to be awake during the day and to sleep at night. The sleep-need hemostat works independently of the circadian clock but Heller says this clock is needed. Otherwise, we would fall asleep as soon as our biochemical demands for sleep were strong enough. (This is why animals without strong day-night schedules, such as cats, sleep in short bursts throughout the day.)

Experiments also show that the sleep need increases when the brain is heated, such as during exercise. This has led some researchers to argue that sleep serves as a temperature regulatory and recovery process for the brain. This evidence also can be explained by Heller and Benington's hypothesis. An increase in temperature boosts the brain's metabolic rate. This causes the glycogen stores to be used more rapidly, resulting in a greater need for sleep.

A Fitful Night's Sleep

Over 30% of older people in the U.S. complain about poor sleep quality. Many wind up relying on drugs to get the sleep they need.

However, regular exercise improves sleep quality and shortens the time it takes to fall asleep report researchers from the Stanford Center for Research Disease Prevention (SCRDP) and Emory University. The finding is based on a study of 43 people ranging in age from 50 to 76. This is a much safer alternative to using chemical aids.

The researchers looked for changes in sleep patterns among 23 initially sedentary volunteers who began a moderate exercise program. They compared the exercise group with a control group of 20 volunteers who did not exercise. At the outset, all participants had mild to moderate sleep complaints Volunteers were eligible for the study if they were not taking sleep medication or if they had been taking the same dosage of sleep medication for at least six months before the study.

The study lasted four months. There were four workouts per week: two 60-minute classes doing aerobic workouts, stretching exercises and strength training using light free weights with trained instructors; plus two 30-minutes sessions of brisk walking done at home.

In their journals, the exercise group documented an overall improvement in sleep quality, i.e. falling asleep faster (14.5 minutes compared to 24), sleeping longer (6.8 hours on average compared to 5.9) and feeling more rested in the morning. No differences between men and women turned up in the data.

New York Section Distinguished Service Award

The New York Section Distinguished Service Award recognizes a New York Section member who has made a contribution of exceptional distinction that is a model for others to emulate. The contribution should be visible, definable, significant, sustained, and includes service to the section, industry, profession or community.

Since 1990 seven awards have been issued, and six of the recipients have been Life Members.

1990	Jack L. Jatlow	LF
1991	Anthony B. Giordano	LF
1992	Robert W. Gillette	LF
1993	William W. Terry	LS
1994	Philip M. Paterno	LS
1995	Amos E. Joel	LF
1996	Roger K. Sullivan	SM

Philip M. Paterno, IEEE Life Senior

RE-SEED

This program started in 1991 with six volunteers and support from the National Science Foundation. Volunteers must attend twelve days of workshops to familiarize them with the science materials appropriate for middle school. The program is directed by Dr. Christos Zahopoulos of Northeastern University. Since the program began, over 230 retired scientists and engineers have been trained in the New England states. Volunteers are expected to devote one day a week for one academic year. However, most volunteer more than one day a week and for at least two academic years. Financial support has also been supplied by the Noyce Foundation.

Write or call: RE-SEED, Northeastern University, 716 Columbus Ave, Suite 378, Boston, MA 02120, (617) 373-8388.

Possible changes for LM status

In 1993, the qualifications for Life Member status changed. The rule had been that an IEEE member had to be at least 65 years old, and that the sum of the member's age and paid number of years of membership equal or exceed 100 years. This was switched to a basic 40 years of IEEE membership with a transition algorithm from 1994 to 1998.

Based on complaints and queries received, a careful review of the IEEE Life Members and Society Life Members qualifications was undertaken by the Life Member Ad Hoc Committee. They are recommending that the IEEE Board of Directors adopt the following concepts.

1) Life Member status require being at least 65 years old and the sum of the member's age and paid number of years in IEEE or one of its predecessor societies equals or exceeds 100 years. However, members who did and or would have achieved Life Membership status under the 1994 IEEE Bylaw during the remaining interim period will still qualify as Life Members up through 1998.

2) Society Life Member status effective 1 January 2001 will require not less than ten years of Society membership immediately prior to attaining Life Membership or while a Life Member. Life Membership in a Society entitles the member to receive, free of charge, the services and publication(s) provided for the basic Society fee. However, the Life Member must confirm each year that such services/publication(s) are still desired.

Who is on the mailing list?

Surprisingly enough, Life members are not the only ones who receive this newsletter. The Life Members Newsletter is also distributed to IEEE members 65 years and older, retired IEEE members 62 thru 64, and special boards and committees.

Where to write

Any ideas you would like to share? Opinions you wish to make known? Questions or problems that require assistance? Simply contact the Life Members Committee or its Staff by writing to: IEEE Regional Activities, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331.

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