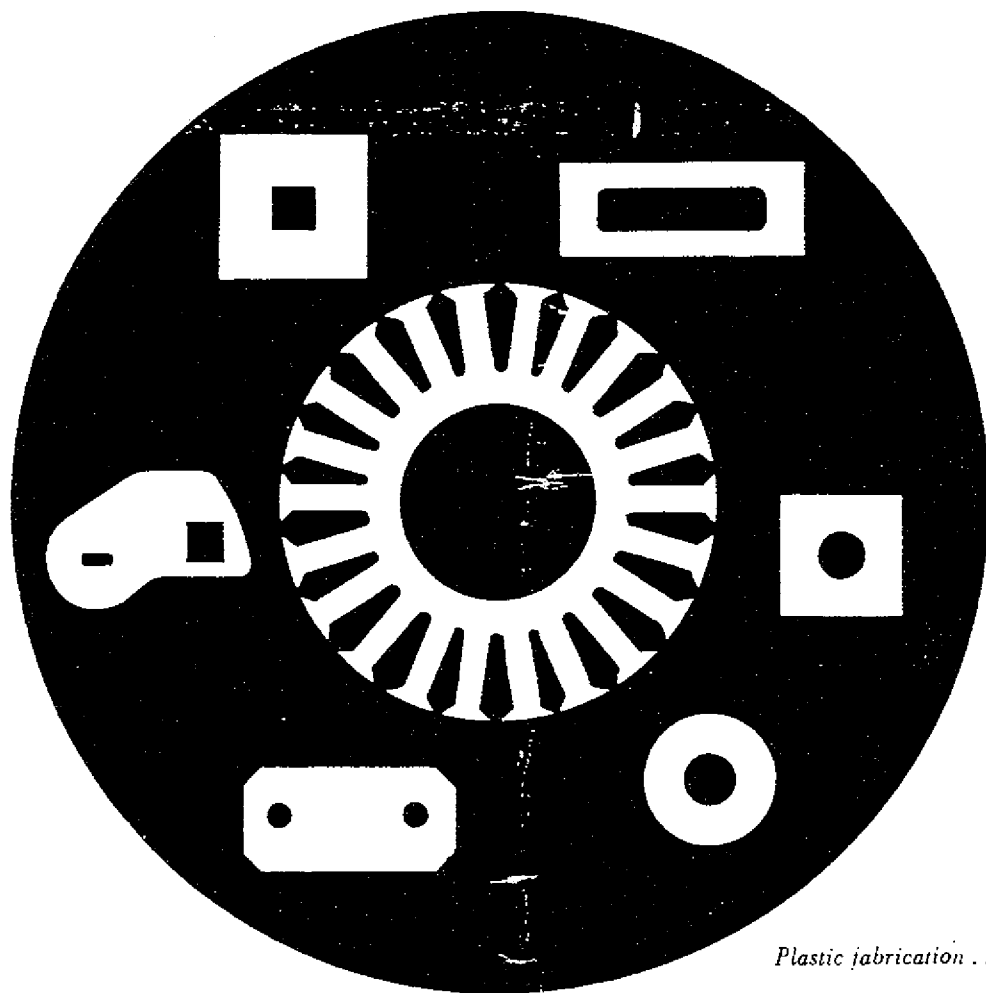


April 1958

Number No. 8113

PLAINTIFF'S
EXHIBIT
E-37

Insulation



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SC-ELEC-02921

Men in Insulation

Donald W. Kitchin, Senior Scientist
Simplex Wire & Cable Co., Cambridge, Mass.

This regular monthly feature is devoted to a leader in the insulation field—his work, background, accomplishments, traits, and goals. These articles are well deserved recognition of the significant contributions these men have made to the industry. It is also hoped that these biographical sketches will provide encouragement to other men concerned with insulation.

When Donald W. Kitchin was in grammar school, he used to get up at four in the morning to spade gardens and dig ditches for five cents an hour in order to buy motors, batteries, and books on electricity. When he was in high school, he arose at the same time in order to milk 12 cows before going to school—and he spent a good part of the night learning code by listening to a Cape Cod station which sent out wireless news to ships.



Though he no longer gets up at 4:00 a.m., Kitchin still packs a tremendous amount of activity into each day. He starts off with a brisk walk and then spends most of his working day at Simplex Wire & Cable Co., Cambridge, Mass., where he is senior scientist. The title, both descriptive and honorary, was awarded to him several years ago in recognition of his more than 30 years of technical and scientific work for the company. Kitchin also manages to get in another walk at noon and tries for a daily swimming session at a pool near the Simplex plant. For relaxation, the same day might find him reading in any one of eight languages; preparing a paper or doing committee work for one of several technical societies; practising Bach or Beethoven on the piano; listening to music on an FM or hi-fi set; studying Functions of a Real Variable or the Lebesgue Integral; taking part in church, scouting, or other community projects; working on alumni or fraternity affairs for Massachusetts Institute of Technology; or turning the Kitchin household upside down in any one of his many "tinkering" type projects.

This zeal for living and quest for knowledge has enabled Kitchin to crowd a lot of life and learning into his 61 years. But in the typical fashion of the person who leads a full, rich life, he finds that there isn't enough time to do all of the things that he would like to do. In his optimistic, good natured manner, however, he has a suggested solution for the problem of time in another life. "We should have something like Riemann surfaces," he suggests, "so that a lot of activities could go on at the same time."

When Kitchin looks back over his 32 years with Simplex, he concludes that it has "generally been fun." It has also been full of rewarding ex-

periences and successful achievement. Everett Morss, president of Simplex, summed up Kitchin's association with the company in this way when he announced his appointment as senior scientist in 1955: "His research has brought much credit to Simplex in many scientific fields and his brilliant pioneering has helped to keep Simplex a leading and respected member of the wire and cable industry."

Kitchin is extremely grateful to Simplex for its liberality in giving him free choice in research project selection and methods. His first research study dealt with the cause and mechanism of "X-wax" formation in oil-paper cables. Using high vacuum techniques, he was able to show that the cause was corona in minute voids—even when it seemed impossible that voids could exist in the material. Other early studies were on impregnation of cables and degassing of the oils.

Most of Kitchin's work has been summarized in papers presented at technical society meetings. Early in his career, Kitchin heard a paper at an American Chemical Society meeting on the X-ray diagram of stretched rubber. It suggested to him that polar molecules might be oriented by an electric field and their motion in a viscous medium might contribute to power factor. (He learned about the Debye theory only later.) Kitchin's work on the subject was one of the earliest applications of dipole theory to ordinary insulating materials. The work also provided the subject for Kitchin's "maiden" paper before the 1929 AIEE midwinter meeting. The praise and encouragement he was given for this work by Drs. V. Karapetoff and J. B. Whitehead made it one of the proudest moments in Kitchin's life. (The paper also received honorable mention in theory and research,

which was then equivalent to second national prize. Another paper in 1932 interpreted the dielectric behavior of vulcanized rubber by the dipole mechanism.

Shortly after the 1929 AIEE meeting, Kitchin was invited to join what was then the Insulation Committee of the National Research Council. Since then, he says, the council's Conference on Electrical Insulation has been the technical group in which he feels most at home. He has held the offices of secretary, vice-chairman, and chairman. He has seen the conference grow from about 40 members to more than 300 and is impressed by the ability of the younger men in the group. He feels that the annual meeting is one of the high spots of his year because of the range and variety of papers presented. He also enjoys the informal atmosphere which encourages the presentation of results "hot out of the laboratory." Kitchin has been the author or co-author of 11 papers presented at the conference. Five were on microbial attack on buried rubber insulation, while the others were on power factor of rubber, a new way of jointing rubber cables, the effect of soft films on d-c breakdown of polyethylene, cutting of rubber by atomic oxygen, the study of corona spaces, and treeing breakdown in polyethylene.

Kitchin's work on microbiological studies of insulation has been summarized in technical journals and has been presented before technical meetings such as the Gordon Conference and other interested groups.

Early in World War II, Kitchin became active in the development of methods for jointing various types of cable—especially submarine communication cables. As a result of his work, he can take pride in having made what he calls a "modest contribution" to the Havana cable, the Air Force and Alaska cables, and the Trans-Atlantic and Trans-Pacific cables.

Kitchin's first years were spent in Lawrence, Mass., where he was born on May 4, 1896. After early grades in grammar school, he attended South Lancaster Academy, which was run by Seventh Day Adventists.

He recalls that like a chameleon, he temporarily became a "Sabbath-keeper," but that conversion did not last even though he has always respected the sect for their sincerity of belief. The country around Lancaster was ideal for elementary skiing and Kitchin, like the other youngsters of the area, put in his apprenticeship on barrel-staves before graduating to fancier skiing equipment. He was also interested in electricity and used most of the money he earned doing odd jobs to buy motors, batteries, and books on electricity.

After the academy, Kitchin attended Methuen (Mass.) High School. At the time, his family owned a 50-acre farm with cows, chickens, horses, and other animals and Kitchin became proficient at milking, plowing, and other farm chores. He enjoyed the rugged, outdoor life but also continued his interest in electricity by building all the equipment for an amateur radio except the phones. This was the time of rotary spark gaps, silicon detectors, and loose couplers, and Kitchin was pretty proud of his 100-foot mast and antenna with spreaders. With the rig, he was able to pick up the Key West and Panama Canal naval radio stations. Kitchin was also interested in Tesla coils and shamed the timid by having his little sister pick off an 18-inch spark with a pair of scissors. When a hurricane blew down the mast, Kitchin dropped radio and took up the study of piano. Although it seems incredible now that he thinks back, he remembers practicing 10 hours on the day after the radio mast fell.

With such enthusiastically prolonged practice sessions and a self-claimed exceptional lack of talent, Kitchin considers it fortunate for his family that he left to attend Phillips Andover Academy soon afterwards. While at Andover, Kitchin planned to eat malted milk tablets instead of supper and use the time to practice the piano. He soberly reflects that it was rather lucky for his own health and for music that he never carried out this plan.

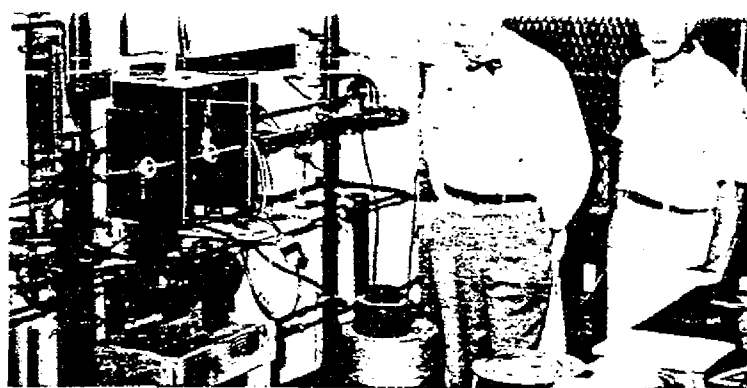
Instead, he turned his energy to the more quiet pursuit of studying

foreign languages—a hobby which has fascinated him ever since. Foreign languages interested him so much that he used the allotted evening study periods at Andover to read French and German novels, and then would have to get up earlier than the rest of the boys to do his required studying. He took an ice cold shower accompanied by a lot of chest pummeling in order to get himself into shape for the early morning studies—but this habit was discontinued when a deputation of fellow students protested.

Kitchin graduated in 1915 after two years at Andover. He received two prizes in German, had the highest general average in his class, and was voted "greasy grind" by his classmates. To prevent the impression that he was a terrific scholar, however, Kitchin points out that he "took most of the tough subjects in his junior year and a lot of foreign language courses during the last year at Andover."

It was during his years at Andover that Kitchin met his wife-to-be, Evelyn. Though it was love at first sight for him, he says she was used to older "mature" college boys, so for quite a while looked on him as just a nice kid, a practice he claims she has continued to some degree. By the time Kitchin entered MIT in the fall of 1915, they were engaged, despite the advice from the older, "wiser" boys who said it was silly and wouldn't last. Kitchin's comment on the matter is: "Now 42 years, three sons, and seven grandchildren later, we are still in love, so you can't always predict correctly about these things."

Near the end of his sophomore year in 1917, when Kitchin was 21 years old—he enlisted in the Signal Corps and got married. He spent 13 months of his two-year hitch in France, but makes no claims to heroism. "We had radio stations near the front lines at Metz, and I saw balloons and planes shot down, but did not get into direct combat," he says. During the last four months of his tour of duty in France, Kitchin attended the University of Besancon and lived with a French family. He enjoyed



Kitchin (on the right) and O. S. Pratt, a co-worker and co-author of recent papers, are shown in the Simplex lab inspecting equipment for studying field-free cutting of insulation by products of electrical discharge, such as atomic oxygen.

the period particularly because of his ability to speak French fluently.

After coming home, Kitchin returned to MIT, where he received his BS in chemistry in 1921. By then, the Kitchins had two sons, so there was no other choice but to find a job. Between 1921 and 1925, he worked for the Fixed Nitrogen Laboratory of the U.S. Department of Agriculture, the Research Laboratory of Applied Chemistry of MIT, and at Arthur D. Little, Inc. While with the Fixed Nitrogen Laboratory, he became interested in glass blowing, which helped him a great deal later on in high vacuum work since he was able to make his own Langmuir pumps and McLeod gauges. During this period, Kitchin developed an automatic train for studying catalysts by continuous gas analysis and was extremely interested and quite proud of the work.

Kitchin has always pursued his hobbies with as much enthusiasm as he devotes to his work. He has always liked to walk and one year kept track of mileage with a pedometer. He clocked 2600 miles excluding walking at work and at home, but credits the pedometer with motivating more than the usual strolling. About 30 years ago, he learned to swim the crawl and has been almost fanatically devoted to swimming ever since. "When I get too decrepit to swim much," he says, "I hope I can coach kids." He has ample opportunity to practice his coaching technique on youngsters spending the summer on Bustins Island in Casco Bay, Maine, where the Kitchins have a summer

place. He finds that the youngsters learn rapidly and it isn't long before they really are "minnows"—a term his wife affectionately uses to describe the group of youngsters that are usually waiting for swimming lessons from Kitchin. Kitchin himself swims three times a day during vacations and week-ends at Casco Bay—including 600 yards before breakfast. He recalls that 20 years ago he swam the three miles around Bustins Island in 1 hour and 27 minutes. During the winter, he trains at the MIT pool (about a 15-minute walk from Simplex) to keep in shape for summer swimming. Some years ago, Kitchin kept up ocean swimming at a Boston beach through November and then swam for a color movie on December 31st. On the same day, a man who fell into nearby Lynn harbor died from exposure that night in a hospital. That was enough for Kitchin's wife, whom he refers to as Mama. "She put a permanent veto on that sort of thing," he says, "and nowadays, I practice moderation—but not to excess."

Though she occasionally lays down the law—as in the case of ocean swimming in mid-winter—Mama is an angel, according to Kitchin, and would have to be to put up with him. Though there are many instances, Kitchin recalls one that was typical of her patience: "I have built my own radios and amplifiers ever since broadcasting started," he said. "Much of the work was done on the 'kitchen' table and you have to be married to an angel to get away with

much of this. I once made a 12-foot exponential horn by making a plaster cast around a properly shaped bag filled with sawdust. I reinforced the plaster with buriap and chicken wire, but the first time I pulled the bag out, the whole works collapsed because I hadn't mixed the plaster correctly. Instead of throwing me out of the kitchen, Mama insisted I start over and finish it after all she'd been through the first time."

At another time, Kitchin became interested in playing the organ. When someone complained about his early morning practising on a studio organ in a supposedly empty business block, he bought a used parlor organ for \$10. One of his sons fixed it up with a blower from an oil burner instead of the foot bellows, but it was pitched too high for accompaniment by another son who played the flute. Kitchin's decision to retune the organ to A435 was another ordeal which must have taxed his wife's patience. "It was quite an operation," he recalls. "In order to tune the reeds, I had to file the ends to raise pitch or file in near the support to lower it." I made a beat oscillator with a neon tube on the output and ran a stroboscope disc with a synchronous motor. Then I beat the oscillator against the 435 cps reed. With vernier control on the oscillator, I could approach each pitch by filing in very small steps and do a precision job. It was easy and fun once I got the hang of filing the reeds properly, but at first the whistle of the oscillator and the steady tone nearly drove Mama wild."

Just before LP records were put on the market, Kitchin started to record from the radio on home-made blanks. He bought 350 old 16-inch transcriptions for 10 cents a piece, steamed the lacquer off the aluminum, redissolved and filtered it, and recoated them 13 at a time in a cabinet with filtered air. He recorded the Philharmonic and other symphony orchestras for about six years and says that some of the records are quite good. He has given up the practice however, and now buys LP records and listens to FM. Kitchin has

also continued his interest in the piano, but claims that the results are definitely not for the ears of the public. He feels that study and practice on the piano adds a lot to his deeper enjoyment of hearing a real artist, however, since it gives him a better idea of what is involved.

The study of languages continues to interest Kitchin. He has read quite a bit in French, German, Latin, Greek, and Russian, and is now reading Dante in Italian. He hopes to get around to finishing Plato's *Republic* and the works of Thucydides and then read *Don Quixote* and *The Brothers Karamazov* as well as several other novels, but lack of time and a renewed interest in calculus have kept him from spending all the time that he'd like on reading.

Kitchin also participates in a lot of activities which he considers socially useful as well as enjoyable. He has been an examiner in signalling for the Boy Scouts, a cubmaster, and even taught Sunday school for a while. He admits that he is no great theologian, but that he enjoyed teaching the classes. He is presently a fraternity chapter visitor at MIT and on the visiting committee to the Department of Mathematics there. He had been on similar visiting committees to the Modern Language Department and the then-unbuilt Hayden Library. Kitchin is also active in fund-raising and alumni work for MIT. He has been secretary and chairman of the Men's Club of his church and he and his wife have twice been co-chairmen of the College Club's Evening Study Group.

In addition to his work for the Conference on Electrical Insulation and the AIEE, Kitchin belongs to the American Chemical Society, the New York Academy of Sciences, and the Cum Laude Society.

Though he has been living his life as fully as he can, Kitchin always has a lot of plans for any spare moments that may come up in the future. In fact, even his idea of a future life is crowded with activity. "If there is a future life," he says, "I hope that there are interesting problems and always something new to be found around the next corner."

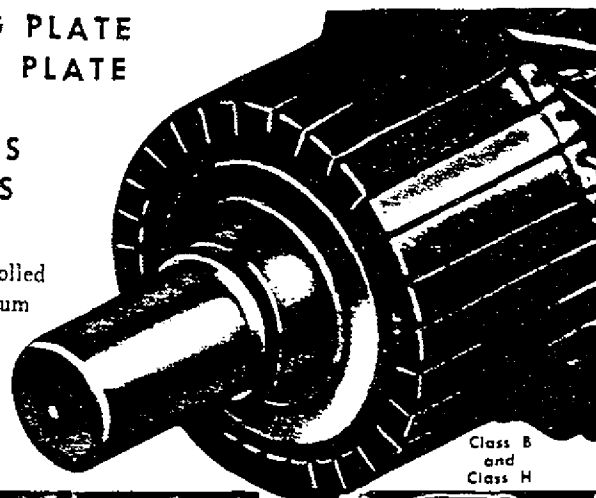
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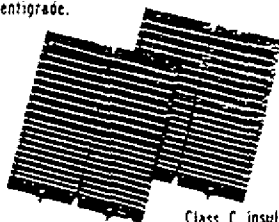


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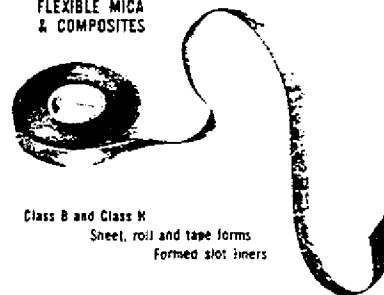
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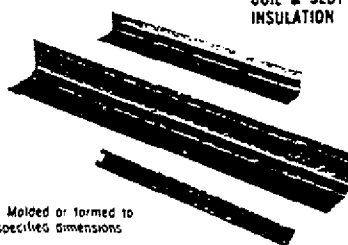
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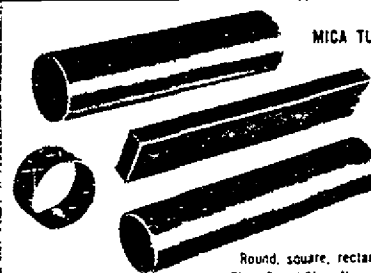
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