SOCIALS—

(Continued from page 4)

awarded a Special $5 prize in the Third Annual National high school Photographic Awards contest. This is a nation-wide picture taking competition, with entries from every section of the country.

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CIMBALO-CECCOTTI WEDDING

Gowned in white marquisette made with a train, and wearing a fingertip veil which hung from a half halo of orange blossoms and carrying white carnations, Miss Betty Jean Cimbalo, daughter of the Jack Cimbalos of 1632 Broadview avenue, became the bride of Aurelio Ceccotti, son of Mr. and Mrs. Dante Ceccotti of San Francisco, California, formerly of Highwood. The Rev. O'Connell heard the exchange of nuptial vows at 10 o'clock in the morning at the Immaculate Conception church. The bride's father gave her in marriage.

Miss Rena Mattei attended the bride as maid of honor. Her gown was of pale green marquisette and she wore a crown of matching braided tulle. Her bouquet was of yellow carnations. The bridesmaids, Miss Ida Ceccotti, sister of the bridegroom, and Miss Marietta Mocogni, and the junior attendants, Frances Cimbalo, sister of the bride, and Joanne Cimbalo, her cousin, were in yellow marquisette. Their bouquets were also of yellow carnations. The crowns of braided tulle which they wore, matched their gowns.

Rudolph Scasselatti served the bridegroom as best man. Harry Golletti, of Freedom, Pennsylvania, uncle of the bride, and J. Bartolai, ushered.

Enea Picchietti, accompanied by Miss Rose Galassini, sang.

The bride's mother wore a navy blue dress with pink hat and navy and pink accessories. Her corsage was of pink roses. The bridegroom's mother was in grey with brown accessories and a corsage like that of the bride's mother. The bride's maternal grandmother chose a navy blue dress and hat, complemented by a corsage of white carnations.

A breakfast for the bridal party and immediate families followed at the home of the bride's parents. Over six hundred attended the reception at the Masonic Temple, held that evening.

Mr. Ceccotti and his bride, who are now honeymooning in northern Wisconsin, will reside at 571 Central avenue.

Among the out-of-town guests were the maternal grandparents, the Nello Gollettis; uncles and children, and Joseph Golletti cousins, the Norman Feltons, all of Freedom, Pennsylvania; and an uncle and aunt, Mr. and Mrs. William Cimbalo and their son-in-law and daughter, the Robert Vecceros, all of Memphis, Tennessee.

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TO ENTER GOLF TOURNAMENT

Among the entries for the Illinois State Amateur Golf Championship at Danville Country Club, held July 7-11, are Nello and Julio Campagni of Highwood.

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BACK HOME

Home from a two weeks' trip to the west coast are the Anthony Arnolds, their son, Ed. and daughter, Gladys of Broadview avenue. They spent five days of their vacation visiting with the Ed. Koebelins of Banning, California, formerly of Highland Park.

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MRS. CHARLES BOEHMER VISITING HERE

Mrs. Charles Boehmer of Charlotte, N. C., former resident of Highland Park, is visiting Mrs. Charles Brace of 325 Bloom St. She hopes her old friends will get in touch with her. Mrs. Brace's telephone is H. P. 1946.

Boys Outing Club Plans Trip To Cubs Game

On Tuesday, July 20th, the Boys Outing and Sports Club, which is a part of the Playground and Recreation Department summer program, will go to Wrigley Field to watch the Cubs play. The cost of the trip and the game is $1.25.

All boys in Highland Park are invited to go on this trip. Sign up with Ken Crowell, director of the Sports Club, or at the Community Center.

LOOK WHO'S HERE!

Barbara Jean has been chosen as the name of the baby daughter born on April 29 at the Highland Park hospital to Mr. and Mrs. Jack Hilton of 632 Onwentsia avenue. The little girl has a brother, Richard, 8.

Mrs. Hilton, the former Mary Ann Rau, is the daughter of the Frank Raus of Westboro, Wisconsin, and Mr. Hilton is the son of Mr. and Mrs. Wilmer Hall of Chicago.

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Mr. and Mrs. Ortwin Schimmel (Jean Cady) of 339 E. Park avenue became the parents of a son, Kim Cady Schimmel, on July 2 at the Highland Park hospital. The Schimmels are also parents of another son, Eric "Rickey," one year old. The H. W. Cadys of the same Park avenue address and Mrs. Rudolph Schimmel of Toronto, Canada, are grandparents.

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On July 3, Mr. and Mrs. Willis Johnson of 652 Chestnut avenue, Deerfield, became the parents of a daughter at the Highland Park hospital.

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A daughter arrived at the Highland Park hospital on Monday, Juy 5, for Mr. and Mrs. Fred Shelton of 389 Roger Williams avenue. Mrs. Shelton is the former Lucille Bowman. Grandparents are the George Sheltons of Laveen, Arizona, formerly of Rice street, and Mrs. Ralph Bowman of Butler, Illinois. The baby has been named Linda Lucille.

Melt down your table scraps when the oven is lighted for other cooking, then salvage and turn over the grease to your meat dealer for cash.

TELEPHONE

(Continued from page 2)

electrical speech waves traveling between two telephones, a function now performed by vacuum tubes.

In another, the audience heard a radio broadcast from a set constructed entirely without vacuum tubes, but using instead several of the tiny Transistors to provide amplification.

A Transistor was also used to generate a standard frequency tone, thus demonstrating its role as an oscillator.

Because of its lack of a heated cathode delay and other differences, the Transistor can also perform some new functions.

The Transistor answers a question scientists have been pondering for many years—how to make semi-conductors amplify and thus provide a simpler, more rugged, smaller device that could perform the functions of a vacuum tube. In the Transistor, two point contacts of the "cat's whisker" or detector type, familiar to radio amateurs, are made to the semi-conductor only two thousands of an inch apart. Input power delivered to one of these contacts is amplified at least 100-fold and transmitted to the other terminal where it is delivered to an output circut. The Transistor is energized by voltage supplied, such as batteries, which apply bias voltages to the two points. The power actually consumed in the Transistor is less than a tenth that used by an ordinary flashlight bulb.

The amplification process can be understood in terms of the discovery made by Dr. Bardeen and Dr. Brattain that the input point is surrounded by an "area of interaction." Within this area the electronic structure of the semi-conductor is modified by the input current. Now, if the output point is placed in this area, the output current can be controlled by the input current. This control of output current by input current is the basic mechanism of amplification.

Semi-conductors have for many years been regarded as an ideal field for research at Bell Telephone Laboratories because of their practical possibilities and rich scientific interest. These materials, whose electrical properties are intermediate between those of metals and insulators, offered particular promise of useful electrical applications, since their ability to carry electrical current can be changed over wide ranges in various ways.

Those materials, like any having the ability to conduct electrical currents, rely for conductivity on the presence of current-carrying electrons. In metals, which are good conductors, there is a ratio of approximately one current-carrying electron to every atom. In insulators, there are practically no such electrons and therefore little conductivity.

In semi-conductors, such as silicon and germanium, some metallic oxides and other compounds, there may be as few as one current-carrying electron for every million atoms. But—and this is the significant feature—this number of carriers may be varied 1,000-fold or more by changing the electronic structure of the materials. Hence the current flowing through the semi-conductor can be controlled.

Prior to the invention of the Transitor, varying conductivity in semi-conductors was employed in rectifiers, such as the copper oxide and selenium rectifiers, and the silicon detector. Bell Telephone Laboratories have for a long time been active in the development of semi-conductor rectifiers. Before the war they had developed silicon detectors for use in microwave radio apparatus and these were supplied for use in early wartime radars. Largely as a result of radar interest, research and development on semi-conductor point-contact rectifiers and the phenomena involved in their operation have been stimulated at other industrial and several university laboratories.

Further Technical Details Follow

In critically examining the implications of the prevailing theory of electrical conduction in semi-conductors, Dr. Shockley was able to predict that it should be possible to control the meager supply of electrons inside a semi-conductor by influencing them with an electric field imposed from the outside without actually contacting the material. Realizing the practical implications of such a possibility he devised some experiments to test his hypothesis but was unable to secure postitive results. The electrons seemed to get trapped in the surface of the material and did not behave just as anticipated.

This part of the problem was tackled on a theoretical basis by Dr. Bardeen. He developed a theory of what happened at the surface which was able to explain satisfactorily many of the observed facts and which led to further experiments carried out in collaboration with Dr. Brattain. In the course of these experiments they invented the Transistor.

Transistor action depends upon the fact that electrons in a semi-conductor can carry current in two distinctly different ways. This is because most of the electrons in a semi-conductor do not contribute to carrying the current at all. Instead they are held in fixed positions and act as a rigid current to bind together the atoms in a solid. Only if one of these electrons gets out of place, or if another electron is introduced in one of a number of ways, can current be carried. If, on the other hand, one of the electrons normally present in the cement is removed, then the "halo" left behind it can move like a bubble in a liquid and thus carry current.

In a Transistor made of semi-conductor which normally conducts only by the extra electron process, current flows easily into the input point, which is at a low positive voltage, and out of the output point, which is at a higher negative voltage. The area of interaction is produced by "holes" introduced by the input current and collected by the output point.

In announcing the Transistor, the Laboratories pointed out that scientific research is coming more and more to be recognized as a group or teamwork job. This is true not only in industrial research but, to a rapidly increasing degree, in academic research. There continues within the group structure, however, ample opportunity for individual work. The Transistor represents an outstanding example of brilliant individual achievement and emphasizes the value of basic research in an industrial framework.

Scientific publications relating to the Transistor will appear in a forthcoming issue of The Physical Review.