FOOTBALL TEAM MEETS BERKLEY THERE ON FRIDAY

Having scored four touchdowns in winning each of the two games it has played this year, Farmington High School's football squad will journey to Berkley Friday afternoon for one of the hardest games on the schedule. Last year Berkley and Farmington locked in a scoreless tie, and each team will be out to break the deadlock.

Farmington will have a considerable handicap through the condition of its backfield men. Injuries, the bugaboo last year, have put in their appearance again this season to annoy Coach Curtis Hall. Harley Spaller has a sprained ankle which interferes with his footwork. Clinton Spies and Norman Barrons have charley horses. The former will probably play, but Barrons' entry is doubtful. Jones will substitute for him if he does not get into the contest. Elmer Catherman will handle the kicking if Spaller is not in the game.

Berkley has a veteran backfield from last year and has lost two or three linemen. The contest will begin at 3:30.

On Monday afternoon the F. H. S. reserves will play Bond School's team, in a contest that is likely to be interesting, and on Friday of next week the Farmington field will be the scene of what is expected to be one of the outstanding battles of the present schedule, Trenton, whose team defeated Farmington 8 to 0 a year ago, will come for another battle.

Trenton has lost only two games in four years. The team is fast and experienced. However, Farmington hopes to be able to provide the stiffest kind of contest provided injuries do not hamper the squad. The game on Friday of next week will begin at 3:30.

The score of last week's game, a 27-0 victory over Madison High of Royal Oak, has raised enthusiasm to a high pitch among Farmington's followers, and an increased attendance at subsequent games is anticipated.

Nobody ever complains about the price of fur coats or silk stockings.

Agricultural Jottings

Eradication methods developed by the California state department of agriculture have almost eliminated the white fly as a citrus insect pest.

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A short honey crop may tempt many bee keepers to remove too much honey and leave the bees too little food for winter, and for the spring brood rearing.

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A new high-yielding hybrid white wheat which is resistant to loose smut has been developed at the Cornell university experiment station. If it is satisfactory in milling tests it may replace Honor.

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United States carriers moved about half of Canada's grain exports in 1929, but only a fifth in 1932.

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Lowly corncobs will probably be developed into a valuable source of by-products such as ethyl alcohol, glucose, cellulose and acetic acid.

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Russian natural scientists report the development of a new grain; it is a cross between wheat and rye, having the quality of wheat and the power of rye to resist cold.

Try an Enterprise Liner.

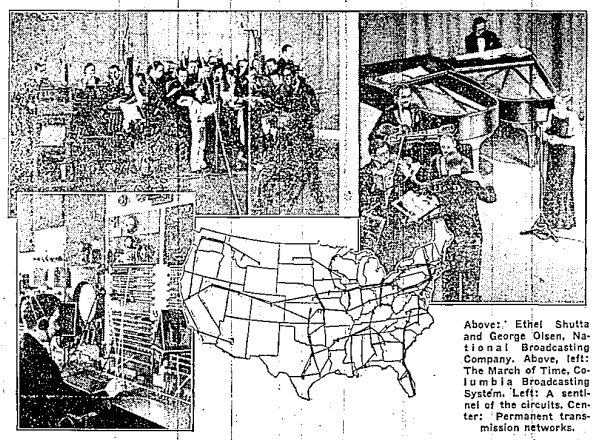
Saxophone and Cornet

Before Adolphe Sax invented what has been described as an "intrinsically regrettable instrument," the saxophone, the "goat" of musical instruments seems to have been the cornet, according to Eadiltx, who points out that Theodore Thomas wrote in his diary some time in the '90s: "At last the summer concerts show a respectable character and we are rid of the cornet!"

Planet Has Many Satellites

The planet Saturn has at least ten satellites, and the famous rings of Saturn besides.

WEAF-WNAC Link, 10 Years Ago, Was Earliest Broadcasting Network



Above: Ethel Shutta and George Olsen, National Broadcasting Company. Above, left: The March of Time, Columbia Broadcasting System. Left: A sentinel of the circuits. Center: Permanent transmission networks.

"This program comes to you through the facilities of . . ."

The announcer names the big radio broadcasting chain which is presenting the program. Then he pauses while you listen to your own local station announcement.

It was not always so. In fact, chain radio broadcasting is so young that only this year has it observed its tenth birthday.

A Historic Event

It was on the evening of January 4, 1923, that long distance telephone lines were used for the first time to connect broadcasting stations for a chain broadcast. On that occasion, Station WEAF in New York, then owned by the American Telephone and Telegraph Company, and Station WNAC, of the Shepard's Stores in Boston, were connected by telephone lines so that both might broadcast simultaneously a program which was being given in the WEAF Studios.

It was a momentous occasion. Members of the Massachusetts Bankers Association were in session at the Copley Plaza Hotel in Boston, waiting to hear the program. Also anxiously waiting to hear it were the Bell System engineers and plant men who had planned and arranged the event, as well as the comparatively few owners of radio receiving sets in New York and Boston ten years ago.

Four Stations Linked

The event passed off successfully, and then it was that chain broadcasting was born.

The success of the enterprise was such that soon long distance circuits were used to supply programs from Station WEAF to other points, and it was considered an important event when, on June 7, 1923, four stations were linked by wire to broadcast a program for the National Electric Light Association.

Not long thereafter, WEAF, New York, and WCAP, Washington, D. C., began what was probably the first series of joint broadcasts, with WEAF furnishing the programs. Up to that time, no permanent networks for broadcasting had existed and every chain event was a special job, requiring the planning of circuit layouts, the moving of temporary equipment, and the dispatching of men to various points to handle it.

WEAF Sold to N. B. C.

Woodrow Wilson talked on a network broadcast in 1923, and when Calvin Coolidge delivered his opening message to Congress in the same year, it was broadcast by stations in Washington, New York, Providence, St. Louis, Kansas City and Dallas. The first major nationwide network of broadcasting stations was the Democratic Day program in 1925, when twenty-six broadcasting stations were linked through about 70,000 miles of long distance telephone wire.

The American Telephone and Telegraph Company sold Station WEAF in 1926, several years' experience having shown that radio broadcasting was unlikely ever to have much relation to its major business of furnishing a means of direct personal communication. In November of that year, permanent wire networks were established, with WEAF as the key station of the National Broadcasting Company. In the following year the first program of the Columbia Broadcasting System was put on the air.

Eleven Networks Link Nearly 200 Stations

With the advent of the organized chains, more entertaining and instructive programs began to be broadcast—not only to the relatively few listeners around the key stations, but to millions of others through local broadcasting stations linked with the key stations by wire.

Since then, chain broadcasting has become the rule, rather than the exception, and so far have we progressed that some programs originate now either aboard ocean liners or across the Atlantic.

At the present time there are eleven networks in this country, connecting 194 radio broadcasting stations. These networks regularly use more than 44,000 circuit miles of telephone wire.

In the earlier days of chain broadcasting, the Bell System's program transmission networks were located chiefly in the eastern parts of the country. As the networks grew and points on the Pacific Coast were added, the distances traversed by a single program might be as much as 5,000 miles. The transmission of program material over circuits of such length made it necessary for the Bell System to introduce a series of improvements in its equipment for program transmission. These improvements have kept the circuits and apparatus in the van with broadcasting developments in general.

Stormproof Cables Now Circumvent Weather

The first important improvement in the circuits came from a modification of the repeaters which are placed at strategic points, to amplify and strengthen the transmitted currents.

Another factor which the telephone engineers had to consider was the weather. The weather in certain parts of the country has no consideration for chain broadcasting, and Mother Nature seemed to take particular delight in playing with an open wire line at the most unfavorable moment, leaving in her wake a broken link in the radio chain. Circuits in storm proof cables were planned for sections of the country where the weather conditions were particularly unfavorable, and the first one was opened between New York and Washington during the summer of 1926.

Improvements in Transmission

To offset other forms of distortion, Bell System engineers developed various improvements in cable facilities used in program transmission until they finally arrived at the type of loading and repeater which are now being used. The circuits, under these arrangements, transmit a sufficiently wide band of frequencies to take care of the tones met in both vocal and instrumental numbers and cause a negligible amount of distortion.

While these important improvements have been made in cable circuits for transmitting programs, further improvements were also required in the open wire circuits, on account of the increased use of studios distant from New York. There was a need for improved circuits linking the east with the far west, and special open wire type repeaters and associated equipment were developed and a highly refined type of open wire circuit evolved which was vastly superior in fidelity of transmission to any open wire circuit used heretofore. This type of circuit is utilized by both the National Broadcasting Company and the Columbia Broadcasting System in their network circuits between Chicago and the Pacific Coast.

Some Notable Broadcasts

The growth of chain broadcasting has witnessed many notable programs. There was, for example, the broadcast of Colonel Lindbergh's return to New York and Washington in 1927, after his famous solo flight across the Atlantic. There was the inauguration of President Hoover in 1929, which was broadcast over 118 radio stations using about 30,000 miles of Bell System wire; the address made in 1930 by King George V of England over a still larger American network; the address made from Vatican City on February 12, 1931, by Pope Pius XI, which stands out as the largest worldwide broadcast yet made; and the extensive broadcast which took place on November 3, 1932, when about 200 radio stations were linked in network for the election returns.

Controls at Strategic Points

For its broadcast transmission service the Bell System has established control points at Boston, New York, Cincinnati, Chicago, St. Louis, Kansas City, Denver, San Francisco, Los Angeles, Washington and Charlotte, N. C. The circuits are lined up and tested at these points and switched to meet the varying requirements of the networks. A close watch is kept, in order to avoid interruptions in the broadcasts. The New York office is in general control of the Red, Blue and Purple networks; that at San Francisco of the Orange, and that at Boston of the Amber.