"Bush" Osborne and his photo recording transit, a highly useful instrument for both field mapping and forest fire detection.

INVENTOR • FORESTER • ENGINEER • SCIENTIST

"BUSH" OSBORNE

● The career of a man who has made many outstanding contributions to the profession of forest fire fighting, the keystone of forestry.

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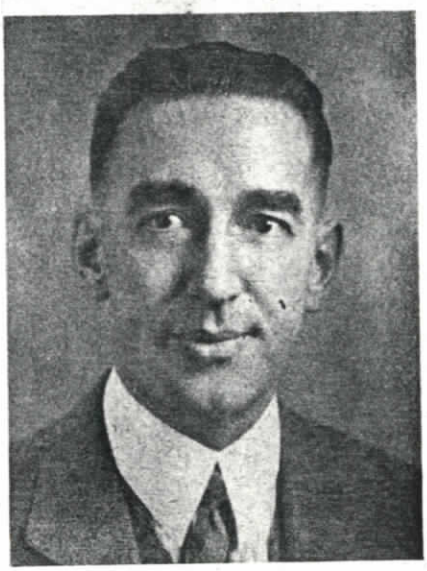
THE RETIREMENT of William B. Osborne, Jr. from the U. S. Forest Service, January 20, 1945, marks an important milestone in the history of forest protection in the Pacific Northwest. Inventor, forester, engineer, scientist, it is difficult to find the precise word to describe this versatile man of the western woods.

"Bush," as he is known to hundreds of foresters, loggers, and woodsmen, has devoted the major part of his professional life to out-smarting the arch enemy of forestry—fire. Through the development of improved techniques, plans, and equipment, he has acquired a widespread reputation as an outstanding expert in the field of forest fire control. Best known, although not the most important, of his contributions, is the invention of the Osborne fire finder, extensively used in forest regions. This is but one of many contributions he has made to forest fire science.

A native of New York State, Osborne grew up there, and received his AB degree from Williams College. Originally he planned a career in medicine, but somewhere along the way he caught a vision of the possibilities in the new profession of forestry. So he got his degree of Master of Forestry from Yale forest school in 1909, and later that year received his first forest service appointment. This was an assignment on the old Oregon national forest, now known as the Mount Hood.

During the years 1909-1910 "Bush" laid the groundwork for the excellent woodsmanship which characterized his later years, by making an extensive reconnaissance of the Mount Hood and Santiam national forests. Here developed that striving for better working tools which characterized his entire career. Dissatisfied with the piecemeal "atlas sheets" then used for maps, he compiled and drafted the first detailed national forest map on the scale of ½ inch to the mile. This gave an excellent general service map, better than any then existing. There were, however, cumulative errors in land line surveys. Hence it did not have the degree of trigonometric accuracy desired for the location of fires from lookouts. So, during 1911-12 he did the surveying, compilation, and drafting of the first trigonometrically controlled national forest map, a procedure which later became standard practice.



W. B. OSBORNE, JR., whose retirement from the United States Forest Service became effective January 20, 1945.

An anecdote of this mapping job indicates "Bush's" flair for accuracy. While occupying a point he found a coast geodetic survey triangulation tablet for which he had no data; so he sent to Washington, D. C., for official record of the location. When plotted, this location did not agree with his by a twentieth of an inch, whereas he insisted upon "pin point accuracy" for his basic control. Subsequent correspondence finally revealed a typographical error. The corrected figures gave a location which checked to pin point accuracy, and "Bush" was happy.

Another incident from the same job is indicative. During the winter of 1911 "Bush" started laying out the control for his map on the best drafting paper then available. This was laid aside in the spring, for more field work. When he returned to the office end of the job next winter, he found that his paper had shrunk across the grain, but not with the grain, thus making his carefully plotted angles "cock-eyed." Undaunted, our young map maker threw away the inaccurate mess, and cast about for a more reliable medium. He finally solved the problem by having two sheets of paper mounted cross-grain, plywood fashion, thus eliminating the uneven shrinkage.

Experiences and observations during these reconnaissance and mapping years decided the trend of his future efforts, and cast him for the major role he was to play during his career. He saw the disastrous effects of past forest fires, and he fought several bad ones in that terrible year of 1910—well remembered by old timers. Again refusal to be

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satisfied with the tools at hand was the motivating force, starting him on the road to outstanding accomplishment.

Familiarity with the high peaks and sweeping vistas of the Mount Hood and Santiam country suggested the possibility of using these vantage points for detecting fires in their incipient stages, thus preventing many conflagrations. So, in 1910-11 "Bush" planned and installed the first series of co-ordinated lookout stations used in Oregon or Washington, and as an adjunct to these built his first instruments for locating fires. These he called the Oregon "fire finders" thereby coining the now universally accepted term for such instruments. Crude at first, these quickly evolved into a precisely machined instrument which he designed and had built in 1913; followed by approximately the present day model designed and first built in 1916.

Over 4,000 of these fire finders are in use, and they are standard equipment for most federal, state, and private protective organizations of the United States and Canada. Numerous young artillery officers now serving in World War II got some of their first training as lookouts, using the Osborne fire finder.

Not so well known as the fire finder, but highly important in forest fire protection and mapping work is the Osborne photo recording transit. This was developed to facilitate various phases of fire protection, as well as surveying and mapping work. About the time "Bush" was inventing the fire finder, he began experimenting with his photographs of the surrounding country, taken from lookout peaks. The first of these were taken with an old 4x5 Century camera, gradually shifted around to obtain a panoramic series. At the same time transit readings were taken on numerous reference points. The pictures then were matched and mounted in a panoramic strip on a large board. Each strip was arranged so that true north coincided with its center, and true south with its ends. By means of a scale along the top of the board, and a plumb line and bob, the azimuth readings could be located on any of the pictures—approximately, but not exactly. Various experiments followed, culminating in the invention and complete designing of the photo recording transit in the period 1927-1931. This instrument combines the principal features of a transit with a specially designed camera. It provides for the registration and accurate positioning of precise azimuth and vertical angle scales on each negative as exposures are made, thus licking "Bush's" ancient enemy, paper shrinkage.

These graduated pictures taken from lookout stations now enable dispatchers and firemen literally to see the exact location of fires reported. This is a great help in estimating probable rate of spread, number of men needed, and actual arrival at the fire with minimum delay. This device is in wide use throughout the country. In Oregon and Washington alone, pictures have been taken from some 1500 stations, with an estimated coverage of 90 per cent of the timbered acreage. Possible uses of this instrument by surveyors or draftsmen are obvious.

While the fire finder and the photo recording transit are the two outstanding inventions in Osborne's career, he has developed or invented many other items of equipment which have caused legions of fire fighters to call him blessed.

Develops Dispatcher System

Although "Bush" retained his interest in improvement of fire fighting equipment throughout his career, we see him, as early as 1913, beginning to broaden out in the field of fire planning and administration. In that year he devised and completely developed the central dispatcher system of fire control, as used in the North Pacific region for many years. He started also the fire atlas records of the forest service, as a means for recording the fire history of each unit, bringing out graphically coverage, relative hazards, and needs in various units and types. The original organization and training of "flying squadrons" or teams of selected men of outstanding ability as overhead for handling work on large project fires, was another innovation.

All of this development in the forest fire field was not "ivory tower theory," but was based on the toughest kind of practical experience. During the period 1910-1936 Osborne had direct supervision, or rendered technical assistance, in the control of some 90 large project fires. He put in some 13,000 hours on actual fire line and suppression work. Figuring 12 hours a day, this would be equivalent to three solid years of fire fighting—a record which perhaps has not been equaled.

About 1915 we see the technician beginning to evolve into the scientist. That year he observed and made practical application of the close correlation between the inflammability of critical forest fuels and the relative humidity of the surrounding atmosphere. Between 1918-1924 he introduced relative humidity observations into fire protection work. This factor now is used by all protective agencies.

In the middle thirties "Bush" was active in collaborating with official inspectors, obtaining compliance with provisions of Article X of the Forest Code; and later he worked with state officials and field representatives of joint committees on forest conservation to secure full compliance with the "forest practice rules" as voluntarily endorsed by most western operators.

During the past few years Osborne has helped materially in focusing attention on the devastating effect of fern fires on reforestation. He is convinced, as the result of these observations and studies, that fern fires are the greatest enemy of reforestation in the Douglas fir region; and that such reforestation will not be attained until the fern fires are licked.

Major publications include three manuals published by the Western Forestry & Conservation Association. These are *The Lookout System, Fire Fighting,* and *Tools, Equipment, and Supplies.* First published in 1918 and 1919, they have been kept up to date by frequent revisions. To date nearly 70,000 copies have been printed. It is believed that they have had wider distribution and use among protection men and forest students than any other manuals or textbooks on these subjects. So probably they may be cited as Osborne's greatest single contribution to the advancement of forest protection.

In summing up the official career of this remarkable forester, it may be said that he has ever been driven by that "divine discontent" which is the hallmark of genius. A perfectionist at heart, he has sacrificed himself freely on the altar of the god-of-things-as-they-ought-to-be. He has made major contributions to the profession of forest fire fighting, which is the basis of successful forestry; and the forests of the Pacific Northwest are and will continue to be greener because of his work.

Although his retirement marks the end of his official career with the U. S. Forest Service, "Bush" Osborne has many years of productive effort ahead of him. He will never be satisfied in this imperfect world. We predict that he will drive on to greater accomplishments in the challenging years ahead.