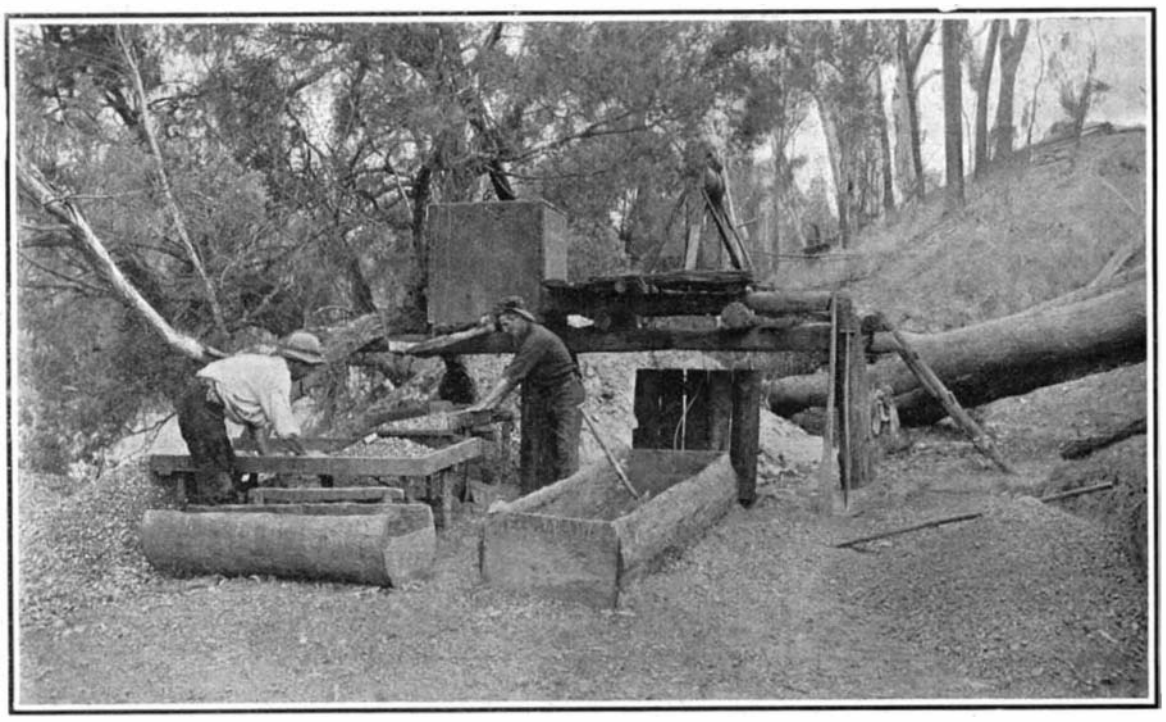
AUSTRALIAN SAPPHIRES.

BY JOHN PLUMMER.

Sapphires are found in all the Australian states, but chiefly at Anakie, in Queensland, where they are obtained in considerable quantities. The sapphire-bearing area, according to Mr. B. Dunstan, assistant Queensland geologist, is of considerable extent, about fifty square miles, extending north and south of Sapphire Town, as the Anakie settlement is designated. The deposits are mostly confined to the granite country, although rarely met with in existing streams. Generally, they are found high above the beds of the creeks, but roughly parallel with the creeks. The sapphires do not travel very far, and if the deposits containing them are washed away, the stones will be found just below any remaining portions, or perhaps only a short distance away. Associated with the sapphire deposits is a quartzite rock, locally known as "billy," which is general in all the eastern portions of the field in which the gems are found, and, when met with in unprospected localities, is regarded as an indication of the probable existence of sapphires in the vicinity. There are, however, localities in which the sapphires are found, although no traces of the "billy" are to be discovered, hence it is assumed that while the rock may have been plentiful in the sapphire-bearing country, it is not that from which the gems originally came.



Treating Sapphire Wash Dirt.

In some places bowlders of basalt invariably occur with the sapphires, and pebbles of basalt in which pleonaste is imbedded are often found. There are numerous basalt peaks scattered over the Anakie field, and a pale blue sapphire, having a thick, black scaly coating on one side, together with abundance of pleonaste, was picked up on the summit of one of these. The stone was obtained at a height of 500 feet above the highest of the sapphire alluvial deposits, and, although there were means by which it could have been taken up to the top from the deposits below, it very probably was weathered out of the basalt, together with the pleonaste with which it was found. The mineral inclusions in the basalt on the tops of the mountains present many interesting features, and are regarded as throwing some light on the origin of sapphires, although it must apparently remain largely speculative. In the different workings on the Anakie field the thickness of the sapphire wash varies considerably, in some places being only a few inches thick, while in others it amounts to several feet.

The bottom is usually a reddish clay, resting on decomposed schists and slates. Occasionally this reddish clay has been mistaken for the bottom, but such is not the case, other and sometimes richer beds having occasionally been found below it. Some of the workings contain only medium sized boulders, while others have boulders too large to be removed by hand. Frequently the sapphire wash is extremely clayey, and requires "puddling" before the gems can be extracted. Much, however, of the wash is loose, friable, and free from clay, in which case the sapphires are obtained by "dry sieving." No general rule can be given to determine what the deposits will be like in any particular place. In a claim the wash may change from a reddish clay to a very dark, fine, friable soil, or from a black soil to one which is white and marly, all carrying sapphires; and from being a shallow surface deposit to one perhaps seven or eight feet deep. In several of the western creeks the wash is of considerable thickness, and in a few of the deposits, so far, no bottom has been found, the wash not being sufficiently rich to induce miners to sink beyond a few feet. That part of the wash which carries the sapphires is often very irregular, sometimes occurring as small patches in the otherwise almost barren portions; while in other places the sapphires are generally scattered throughout the wash. As the older formations which form the bottom of the deposits vary in composition, so does the color of the deposits which rest on them. Where the bedrock consists of decomposed slates and schists, the wash is inclined to be reddish; where granite is present, the wash is yellowish; and where the basic volcanic and intrusive rocks are on the bottom the wash is almost black. The blue stones are most numerous on the eastern fields of the district, and the green ones on the western fields, while the parti-colored stones are common to both. Yellow sapphires are extremely rare. Shades of blue range from light to dark, but the rich cobalt-blue color—the cornflower blue—has yet to be found. The green shades vary from a light-tinted pale green to a deep olivine green. The light green stones having a just perceptible golden tinge are very beautiful, and according to Dr. Dunstan, might be appropriately termed "Oriental chrysoberyl," while the pure green would be "Oriental peridot." Some fine specimens of the Oriental topaz, both of canary and orange yellow shades, have been obtained, but the "Oriental ruby," the red variety, is extremely rare, the one or two found being of perfect color. The purple-tinted stone, "Oriental amethyst," is also rare, but when found has the true amethyst color.

With the sapphires in the alluvial deposits the hyacinth, a well known variety of zircon, is frequently found, mostly in the shape of small grains, of shades varying from brown to deep blood-red, the stones suitable for cutting as gems being comparatively rare. Some of the colorless hyacinths have a resemblance to rough diamonds, and have been mistaken as such. They have rounded faces, are brightly polished, and possess a brilliant luster, but are betrayed by their inferior hardness. In some of its richer shades the hyacinth is extremely beautiful, and, although softer than the sapphire, is harder than opal, the much prized Australian gemstone. Several of the stones have the property of altering their color. Occasionally miners who have carried stones in their pockets have found the color affected by the warmth of the body. When heated the stone becomes lighter in color or changes from red to brown. Intense heat will destroy all the color. When only slightly heated the stone, as it becomes cool, resumes its natural tint. The same effect is obtainable with sunlight. The sapphire wash-dirt is, as already hinted, treated in a somewhat primitive yet very effectual manner by means of sieves of peculiar construction, which save even the smallest stones.

Working a Sapphire Deposit.

AUSTRALIAN SAPPHIRES.

A correspondent of the New York Times writes the following interesting letter to that publication on a school for airship experimenters:

"The benevolence of philanthropists has been, up to this time, mainly directed to libraries, schools, universities, and other institutions of learning. There are manual training and technical schools, but there are no institutions where untold numbers of capable and practical men, especially workingmen, can be advised and financially helped. Frequently such men have to give up the pursuit of ingenious inventions for lack of means to perfect them. Applied science would certainly be much promoted if inventors were given the opportunity to work out their inventions to a degree of commercial utility, which otherwise they could not afford to do.

"If we look at the field to which so many now turn their energies and money, air navigation, it appears as if they were tying the cart before the horse. Instead of advancing on a sure, scientific, and practical basis, they waste money on balloons, which lack the first requirement, dirigibility. Would it not be more sensible to recognize the immature state of the science of air navigation and to first exhaust all resources by offering prizes to scientific and practical men for valuable propositions to overcome the principal obstacle, resistance of the air? Until this problem is solved balloons will remain mere toys.

"If there existed an institution in which ideas, patterns, or developed models could be examined and where the inventor would be allowed to finish and test his invention and to demonstrate its commercial value, there would certainly be more chances to accomplish quicker and better results.

"Suppose one or more such institutions should be created, does it not stand to reason that in a given time such institutions would be self-supporting? The inventors, in case of success, would only be too willing to divide their revenues from such institutions with the institution that enabled them to finally reach success."

For several weeks during the drought from which a portion of central southern Florida has been suffering for a long time, heavy fogs were of frequent occurrence. The amount of water that these yielded was determined by the Rollins College weather observer by supporting a weighted sheet of filter paper near the ground during the night, and allowing it to remain carefully protected from the sunshine until the dissipation of the fog in the early morning, and then weighing the saturated paper. It was found that a very dense southern Florida fog is not equivalent to more than 0.002 of an inch of precipitation as measured by a rain gage.

The use of nitrogen gas has been tried in France for inflating tires.