A MONSTER SHARK CAPTURED.

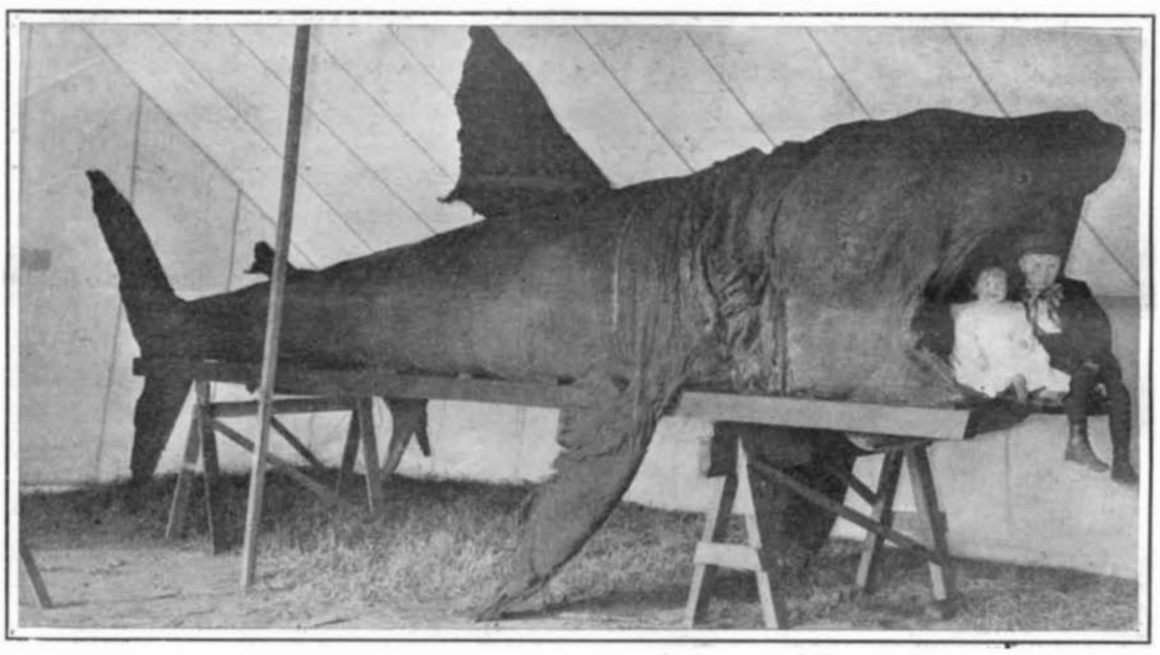
BY J. MAYNE BALTIMORE.

Sharks often attain a very large size along the Pacific coast, especially off the shores of Southern California. Very recently, a monster shark was captured by two Italian fishermen in San Pedro Bay, that is claimed to be the largest fish of that kind ever caught in the world. Beyond doubt it is certainly one of the largest ever captured anywhere.

When drawn out of the water and killed, this sea monster weighed 14,000 pounds. It measured from tip to tip 32 feet, and the circumference of the body just forward of the huge dorsal fin was 15 feet. Across the fearful mouth—horizontally—when opened it was 2½ feet, while from the tip of the snout to the point of the lower jaw it measured 3½ feet. The size of the huge mouth may be judged by the photograph—being large enough for two children to be comfortably seated therein.

The shark became hopelessly enmeshed in some 1,500 feet of the fishermen's net. The net he speedily tore into strips; but in the giant creature's efforts to escape, the strings and ropes were wound many times around its gills, and the shark was held a fast prisoner. Despite its long and frantic struggles for freedom, the shark was finally stranded and killed with harpoons. The struggle lasted for more than an hour. The monster's stomach was found full of fish. It was engaged in robbing the net when it became entangled.

So far as here known, the largest shark yet caught was 22 feet long—10 feet shorter than the San Pedro Bay monster. In capturing the latter the two fishermen had many narrow escapes from being snapped up by the creature. It made a long, savage, and desperate struggle for its life. The shark was skinned and stuffed, and has been placed on exhibition. Efforts, it is understood, are being made by the Smithsonian Institution to secure this splendid specimen of the shark family.



A SHARK 32 FEET LONG, CAPTURED AT SAN PEDRO BAY, CAL.

Aluminium-containing Plants.

Aluminium is the radical of clay, for what the chemist designates as clay is merely a combination of aluminium and oxygen in certain proportions. Now since clay (as the name already indicates) is contained in all argillaceous kinds of soil, we may at once conclude that this element has a vast distribution in the superficial strata of the earth. Hence it would be wholly inexplicable if plants were to take up from the soil no aluminium whatever, or only in exceptional cases. Hither to, however, only a very few vegetable growths have been known in which aluminium can be shown; especially, snake-moss (*Lycopodium*). To clear up this discrepancy, the University of Odessa appointed a competition in which further investigations on the presence of aluminium in plants were to be conducted. Two young Russian botanists who devoted themselves to the task have reached the result that all the plants investigated by them take up aluminium in greater or less quantity when it is made accessible to them in proper form, and that, too, not only from the soluble but also from some salts insoluble in water, as from clay phosphates. That aluminium has been so seldom found in plants, is to be explained by the fact that it is retained mostly or wholly in the roots. Above all, however, it is to be considered that aluminium, in spite of its general distribution, is but seldom contained in such combinations in the soil as can be worked up by the plants. That is an advantage, indeed, because the soluble salts of the clay even when greatly diluted exert a poisonous effect upon plants, especially upon the roots when the clay is touched while they are still in rapid growth. Yet—as is indeed very often the case also with the effect of poisons upon the human and animal organisms—small quantities of aluminium may be absolutely helpful in the development of the plant.

The Heart of Rameses and Its Chemical Composition.

An interesting report concerning the durability of cardiac muscle has been presented by Prof. Lortet, of the French Academy, who has been concerned in investigations in regard to the condition of the heart and viscera of the embalmed body of King Rameses II., who died 1258 before Christ—3,164 years ago. There were four vases which contained the remains of internal portions of the body. Three of these were of certain indeterminable granular substances mixed with pulverized soda, and are respectively considered to be the remains of the stomach, liver, and intestines of the dead king. The lid of the fourth vase was ornamented with a jackal, and when opened it was found to contain the heart, the appearance of which was an oval plate. So solid and horny was the tissue, that it could not be severed without the assistance of a saw.

Alcohol Investigation for the Government.

As a result of the passage of the bill allowing the production and utilization of alcohol for industrial purposes, without the internal revenue tax, the Department of Agriculture has decided to publish a bulletin on the 1st of January, 1907, when this law goes into effect, placing before the public a collection of the best obtainable data on the use of alcohol in small engines. For this purpose Prof. Charles E. Lucke has been retained by the Department as expert to conduct a protracted series of investigations in the laboratories of Columbia University. The bulletin will contain all of the work done on the subject both here and abroad, as far as it is possible to obtain the same, and it will constitute a very complete bibliography, giving as well the results of experiments and the conclusions drawn therefrom regarding American engines. It is hoped that all those interested in this question will forward to Prof. Lucke any information of which they may be in possession, or inform him of the location of existing data. Possessors of patents covering inventions bearing upon the subject will do well to provide Prof. Lucke with copies of the same, and if possible to submit all apparatus intended for the utilization of alcohol, such as vaporizers, carbureters, or engines complete. These will be tested in the most thorough manner, and the experiments will be conducted without any expense whatever to the public, except for the transportation of the apparatus. The reports of the tests will be published in the bulletin. Information or apparatus should be addressed to Prof. Charles E. Lucke at Columbia University, and they will be returned when the work is completed, due acknowledgment being given for the assistance rendered.

The Current Supplement.

A very thorough description of the more prominent cars which took part in the Grand Prix opens the current SUPPLEMENT, No. 1595. Good pictures accompany the text. Mr. Herbert C. Sadler writes on the present status of the turbine as applied to marine work. Although the high-speed motor boat has claimed much attention during the last two years, it is a very recent introduction. A paper by James A. Smith discusses the modern types of high-speed launches which have been rendered possible by the developments in internal-combustion motors since the present century opened. Mr. H. Dollman writes in an entertaining vein on Summer Lepidoptera. The paper on "Insecticides: Their Preparation and Use," is concluded. Dr. Oskar Nagel gives a few helpful suggestions on the utilization of gas from suction producers. Nobody has ever satisfactorily explained why it is that we see objects in their true position, although our eyes are really constructed to give inverted images. The Abbé Noguier de Malijay writes on a new theory based upon anatomical facts. The Abbé's paper is published in the SUPPLEMENT. A Methodical Experimental Study of the Aeroplane is undertaken by Victor Tatin. In an article entitled "Astronomical Consequences of the Pressure of Light," the views of Prof. Poynting are presented.

THE FLAMING ARC LIGHT.

BY A. FREDERICK COLLINS.

The flaming arc light and lamps for producing it were brought to the immediate attention of the American electrical fraternity by Prof. André Blondel, of the Ecole des Ponts et Chaussées, Paris, during a visit of that learned savant to the United States in 1904. At this time he read a paper treating of the production, properties, and applications of all the various kinds of arc lights. Especially interesting is that portion relating to electric arcs formed between mixed electrodes—that is, carbon impregnated or mixed with mineral substances, and those carbons having cores in a cylinder of pure carbon containing one or several longitudinal canals of small cross sectional area, and filled either with mineral substances only, or preferably with mixtures of carbon; these are the kind used for the production of flaming arcs.

The history of mixed carbon is a long one, its origin dating back to 1876 when Jablochkoff invented that extremely simple type of arc lamp termed the electric candle. It will be remembered that this lamp comprised two parallel and stationary carbons fixed in their relative positions by a small amount of the kind of clay called kaolin, which cemented them together, and not only did this inventor employ this material to insulate his carbons but also to fill their central cores. The object, obviously, of filling the cavities of the carbons with this substance was then, as it is now, to increase its light-giving properties, and there are many kinds of matter since discovered that assist in this direction. Du Moncel found that the addition of the salts of lime, provided the proportion was high enough, doubles the light for an equal section of carbon; Archerean and Carré ascertained that the same was true of the salts of calcium, magnesium, and strontium when mixed with the paste of carbons. These and many other experiments were made along in the seventies.

To augment the conductivity of the arc Carré added the borates of soda, potash, magnesium, etc., to the carbons by mixing or by impregnating them before they were molded, while Faissner showed that the addition of boric acid aided greatly to make the arc more stable, while Wortley, Lacomb, and others added silicates, sulphates, chlorates, and phosphates to the carbons either before or after molding, in order to reduce the combustion.

To the researches of Bremer are we more strictly indebted for the invention of the flaming arc, for he has shown that by mixing, or mineralizing the carbons, as it is called, with compounds of calcium, strontium, and magnesium in the proportions of 20 to 70 per cent a long and brilliant arc can be secured.

The flaming arcs thus far shown in this country produce a light yellow, red, or vivid white light according to the carbons used; the addition of the salts of fluoride, bromide, and iodide of lime give the light the yellow tint, while other salts of lime give the flame a red color. In the early lamps of Bremer the positive electrode was made of pure carbon and the negative electrode of mineralized carbon. The vertical axial arrangement of the electrodes the inventor did not find satisfactory when carbons mixed with mineral substances were used, owing to the interference of the slag which, when melted, falls upon the negative carbon and prevents the free passage of the current. To obviate this difficulty he designed a new lamp, and instead of placing the carbons in a vertical position and in alignment, he set them so that they converged with their free ends downward, as shown in the illustration Ordinarily, when the carbons are thus mounted, the arc would form above the points of the carbons; but by introducing an electromagnet above the arc, the latter is projected by the repelling influence of the magnetic lines of force below, which not only permits the slag to flow away easily, but to maintain the arc in a stable condition and increasing its efficiency. This lamp was shown at the Paris Exposition in 1900, and created much favorable comment.

As M. Blondel points out, the principal phenomenon exhibited in the arcs produced with mineralized carbons is the lengthening of the arc. For equal voltages the length of a direct-current arc, which then becomes a flaming arc, is five times as long as an arc between solid carbons. Then, again, the aspect of the arc with properly-mixed carbons becomes quite abnormal, and there is no longer a great and brilliant crater on the